Mangroves

Local livelihoods vs. corporate profits

World Rainforest Movement

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ABOUT THIS BOOK

This book gathers a selection of articles published in the monthly electronic bulletin of the World Rainforest Movement (WRM), addressing the issue of the processes leading to the destruction of mangrove forests and the struggles developed at the local and global levels to protect and use these forests in a socially equitable and environmentally adequate manner.

The level of detail and analysis in the articles varies greatly, as a consequence of the nature of the bulletin, which is intended to serve as a tool, both for individuals and organisations acting on a local level and for those working on an international scale. However we have included most of the articles, as we consider that in some way they can all serve to generate resistance and solidarity movements regarding a subject such as this, of vital importance both for the survival of local communities whose livelihoods depend on mangroves and for the future of a unique type of ecosystem such as this.

Most of the articles are the result of a collaborative effort between the WRM bulletin's editorial team and people and organizations working at the local and global level to protect the mangroves. Special mention must be made of the involvement of the people from the Industrial Shrimp Action Network in the production of an entire issue of the bulletin (October 2001), focused on mangroves and shrimp farming. The numerous sources of information on which the articles were based are detailed – by article – at the end of this book. The articles have been organized in different sections and within each section by date, in chronological order of publication.

Responsibility for this publication is shared between the WRM editorial team and the numerous individuals and organisations who contributed articles or relevant information for the preparation of articles. Errors that may have been made are the exclusive responsibility of WRM.

But what matters most is that beyond the authorship of the different articles, the true protagonists of this work are the numerous local communities in the tropics and subtropics who suffer from the impacts of mangove destruction and degradation, who resist appropriation of their territories by industrial interests and whose knowledge allows the sustainable use of this type of ecosystem. The articles attempt to reflect the struggles of these protagonists, with the central aim of supporting them. To all of them, we pay our most sincere homage.

INTRODUCTION

The mangrove: a unique type of forest

Generally speaking, public perception regarding tropical forests rarely includes mangrove forests, in spite of the fact that this type of ecosystem is found exclusively in tropical and subtropical regions of the planet. Clearly, their characteristics are entirely different from what popular imagination considers as “tropical forests” (exuberant vegetation, gigantic trees, accompanied by the most varied range of species of fauna). However, this does not mean that mangroves are not a type of tropical forest, and a unique one at that.

This book includes numerous articles describing mangrove characteristics in detail, highlighting the social and environmental benefits it provides as well as the struggles for its conservation. Therefore we do not intend to enter into this level of detail but to provide an overall vision helping those who will delve deeper into the book to understand the issue globally.

First of all it should be stressed is that this type of forest is located in zones that are permanently flooded, but also characterised by the presence of salt water. These are forests where the trees "advance" into the water, either on the coasts of oceans or in the deltas of rivers flowing out to the ocean. Few species of trees can survive under these conditions. Mangroves (which in fact are not one, but 20 species of trees on a world level), are able to adapt to these difficult conditions and in turn, to generate the conditions for other species, both fauna and flora, to establish themselves in this environment.

It is therefore a unique type of forest, which in turn provides certain goods and services that are also unique. One of its main functions is the protection of the coastal strip from acute atmospheric phenomena (cyclones, hurricanes), that commonly occur in regions where mangroves develop. It is also fundamental for the development of numerous species of fauna (fish, shrimps, shellfish, fowl, etc.), that use it as shelter, to obtain food and where they are able to breed. The sum of these goods and services in turn provides a means of living to many human communities living close to mangroves and that strongly depend on mangroves for survival.

However, at present mangroves are undergoing a serious process of degradation and disappearance. On a world level, it is estimated that 50% have already disappeared and a large part of the remaining ones are threatened. The reasons are various, but are mostly related to large-scale business activities.

The shrimp industry is the one that stands out in the destruction of the mangrove. This industry establishes itself in mangrove areas, precisely because that is where shrimps develop naturally. However, they do not limit themselves to “fishing them,” but attempt to substantially increase their production and even the size of shrimps. What happens is that large areas of mangroves are substituted by enormous “ponds” where commercially valuable shrimps are “sown” and artificially fed.

This is thus a large-scale industrial monoculture, experiencing all the problems which affect monocultures, in particular, diseases. When these appear (and they always do), they are treated with antibiotics while the operation is financially viable, then the company simply leaves the zone and seeks a new mangrove area to repeat the same process. What they leave behind them is a destroyed mangrove and an impoverished population --due to the loss of mangrove resources on which they depended-- but this does not seem to bother either the shrimp companies or the governments allowing them to develop their destructive activities. Why? Simply because it is an exporting sector: the companies obtain their dollars and the “macro-economy” its hard currency. Neither the environment nor the people seem to appear in this equation.

Paradoxically, an important actor in the destruction of mangroves is the tourist industry. The paradox lies in the fact that it is installed in these zones due to the fact that they are clearly attractive to tourism. However, in many cases it does all it can to destroy them: from the construction of highways and roads, to the building of major hotel facilities. All this, at the expense of mangroves. In their eagerness to increase their profits, they "clean" wide areas of mangroves to widen the beach area and therefore the number of bathing tourists. The result is not long in coming. The first hurricane makes everything disappear --due to the lack of protective barrier supplied by mangroves-- not only the beach, but also all the facilities built along the coast. The tourist attraction disappears and the industry dies.

In many countries the central problem is oil and natural gas exploitation. It should be remembered that mangroves develop in water and one of the main characteristics of oil exploitation is contamination of water. As a whole, mangroves are affected by this contamination, which starts off by having an impact on the species of fauna living there, and ends up by killing the trees. Given their coastal location, mangroves are affected both by off-shore oil exploitation as well as by continental oil activities, as in both cases the contaminantion ends up at the mangrove.

Although on a lesser scale, mining is also an agent of destruction in certain regions of the world. In fact, some mineral fields are to be found in mangrove areas and commercial exploitation implies total destruction of the forest.

So far, we have pointed out the agents destroying mangroves, but it is also important to note which actors are intervening in its conservation. Among these, mention must be made of the local communities that use them traditionally as sustenance. In fact, it is they who are struggling to conserve mangroves, for the simple reason that they need them for survival. At the same time, they have traditional knowledge on their sustainable use. For this reason, these local communities are generally at the forefront of struggles in defence of mangroves.

In turn, it is important to point out the essential role played by environmental NGOs in their support of local struggles and in the generation of awareness on a national and global level of the socio-environmental importance of mangroves. In their individual and collective actions, they have in many cases managed to halt processes of mangrove destruction and promote the adoption of specific legislation on this ecosystem. On a global level, they have actively participated in international processes and campaigns that have also led to important progress regarding mangrove protection.

More recently, the appearance of (low impact) eco-tourism has also added to the protection process, developing alternatives, making small-scale tourist activities compatible with mangrove conservation.

From this brief description of the problem and of the main actors involved, the conclusion is clearly seen to be that the future of mangroves depends essentially on a change in the correlation of forces between those contributing to their destruction and those fighting for their conservation. In this respect, it is evident --in particular, on reading the many experiences included in this book-- that local communities are the central nucleus in the struggle. At the same time, it is equally clear that the local struggle must be projected to a national level in order to have a positive influence on government decision-making. Therefore it is essential to widen the front for mangrove defence, incorporating all those actors willing to participate in the struggle: traditional communities, peasants, fisherfolk, indigenous peoples and workers organisations, environmental and social NGOs, academics, parliamentarians, journalists and the public in general.

Finally, the development of campaigns on an international level is essential in order to have an influence on those actors and global processes whose political and economic decisions result in mangrove destruction or conservation (such as multilateral credit institutions, international

environmental conventions, bilateral cooperation agencies, etc.) as well as the consumers themselves (of shrimpa, tourist services, oil).

We hope that with this book --and in particular the dissemination of the heroic struggles taking place on a local level-- we can contribute to the process, helping to generate more awareness about the problem, that in turn will result in the necessary change in the correlation of forces in the struggle for the future of mangroves.

Ricardo Carrere
WRM International Coordinator

WRM BULLETIN EDITORIAL ON MANGROVES

The October 2001 issue of the WRM Bulletin was dedicated to mangroves and shrimp farming. In its introduction we said: "Shrimp farming is being widely promoted throughout the tropics, severely impacting on mangrove ecosystems and on local people's livelihoods. Given the importance of the problem, we decided to produce a WRM Bulletin entirely focused on mangroves and shrimp farming, and to request the collaboration of people and organizations involved in this issue. We wish to thank all those who provided information and analysis and particularly the Industrial Shrimp Action Network people, with whom we worked very closely to produce this bulletin." What follows is the editorial of that bulletin.

Mangroves and shrimp farming: deeds, not words

There are clearly two conflicting international agendas, one positive and another negative. The former, officialized in international fora such as the 1992 Earth Summit and its related conventions and processes, is aimed at the sustainable use of resources for the benefit of the present and future generations. But there is another international agenda, aimed at increasing production, trade and consumption of all types of products, regardless of their sustainability, for the benefit of private business and governments. Industrial shrimp farming constitutes an example of how local people try desperately to implement the former agenda, while governments, corporations and international financial institutions support the latter.

The importance of the environmental services provided by mangroves is undisputed and so is the need to ensure their conservation and rehabilitation. At the same time, they constitute a vital economic resource for local people, whose livelihoods are directly dependent on this ecosystem. It would thus seem obvious that governments and international agencies that have committed themselves to environmental protection and to poverty alleviation should ensure the conservation of mangroves. Unfortunately, this is seldom the case.

On the contrary, many tropical country governments are strongly supporting the development of industrial shrimp farming, as a means to increase exports and thus obtain much needed hard currency. This necessity is on its part linked to pressures from international creditors and institutions such as the International Monetary Fund and the World Bank, that promote export-oriented economies to ensure payment of external debt servicing. As a result, increasing areas of mangroves are destroyed and local people become either poor or poorer. While the macroeconomy grows and corporations increase their profits, the local economies are negatively impacted or destroyed.

Differently from governments and international agencies, many local communities are truly committed to protecting the mangroves on which they depend. Throughout the tropics, they are trying to halt the spread of a destructive shrimp farming system that provides unnecessary food to the well fed and takes the food away from the table of the hungry.

In this struggle, the answer has in too many cases been repression. People have been killed, injured, imprisoned, displaced. Among those who have fallen, we would like to pay homage to Korunamoyee Sardar, a brave woman killed in Bangladesh on November 7, 1990, for defending local land rights against their appropriation by an industrial shrimp farmer. Korunamoyee has become a symbol of resistance and her example is being followed by increasing numbers of people throughout the world.

At the same time, Korunamoyee is a symbol of consistency between words and deeds. When declaring that mangroves and local peoples' rights need to be protected, then the only possible course of action is, regardless of the consequences, to work for the achievement of those objectives. This is what she did. Governments have not only expressed their commitments: they have signed relevant international agreements. The World Bank has not only said this orally: it has included environmental protection and poverty eradication in its own mandate. It is now their obligation to make deeds coincide with words. They therefore need to halt further support to an activity such as industrial shrimp farming, which is clearly contradictory with international environmental treaties and with the stated aim of eradicating poverty. (WRM Bulletin Nº 51, October 2001).

MANGROVES: AN OVERVIEW

The following section contains a number of articles describing both the mangrove ecosystem (including the important social and environmental services it provides), as well as the main problems it is facing. We hope that this will provide readers with the necessary information to understand why so many people are fighting to protect this ecosystem and to encourage them to get involved in this struggle.

Mangroves and their uncertain future

Mangroves are the coastal equivalent of tropical forests on land. There are various types of mangroves: coastal mangroves, growing without the input of fresh water from inland and that can extend for various kilometres, mangroves growing mainly at the mouths of rivers or deltas, that may be very extensive, and coral reef mangroves that grow on coral reefs above sea level. But they all have something in common, they are very special, fragile and endangered "salt water forests".

Mangroves are characterised by the woven maze of trees and roots, that are in fact an orderly forest mass, growing in bands according to their differing degree of resistance to periodic flooding by tides and therefore, to salt.

They grow on protected river estuaries and banks in equatorial, tropical and subtropical coastal zones, adapted to tide flow. At high tide, their canopy is barely apparent above the water. At low tide, their respiratory roots are visible, capturing oxygen and transmitting it to the buried roots. This adaptation enables them to survive in soils without oxygen and with a high saline concentration, their leaves also adapt to the scarcity of fresh water and are able to eliminate excess salt.

Mangroves are an irreplaceable and unique ecosystem, hosting incredible biodiversity and among the most productive ecosystems in the world. They house a wide variety of life: migratory birds, marine creatures and reptiles in addition to associated species of flora.

In spite of the fact that at world level there are some twenty species of mangroves, the basic structure of individual mangroves is usually formed by between 3 and 8 species. A wide variety of representatives of the plant kingdom live on them, over 100 fungus, and under them, up to 70 aquatic plants.

The aerial roots of their trees form a web, hosting a multitude of animal species (fish, molluscs, crustaceans) and they operate as zones for mating, refuges and nursery areas for a large number of species, many of them of importance as human food, which has made it possible for populations to settle around them, having their subsistence in resources generated by this ecosystem. Herons, cormorants, eagles and kingfishers find their source of food in mangroves.

When the tide goes down, some mammals approach the beach to eat, such as the wild boar and shrimp-eating monkeys. In the canopy, other primates feed on mangrove leaves and they shelter iguanas, parrots, doves and waders such as spoonbills, ibis, etc. that return to the canopy every night to roost.

Mangroves, in addition to protecting the coasts from erosion caused by hurricanes that periodically scourge these tropical zones, have, for many centuries, provided a multitude of resources to the local population. The most common uses of mangroves and their ecosystems are extraction of firewood, material for housing, and more importantly, fishing and harvesting of sea products, including many crustaceans.

However, thousands of kilometres from this unique ecosystem, so rich in biodiversity, at the tables of the European countries, Japan and the United States, we find the origin of the progressive loss of this balance: consumption of shrimps grown in ponds by the shrimp industry. This consumption has risen over the past years and thousands of hectares of mangroves have been transformed into breeding ponds, where created economic interest is very strong.

The shrimp industry benefits from mangrove conditions to breed shrimps, converting into "ponds" millions of hectares of fundamental habitats for local economies and for biodiversity. Thanks to the support of governments and grants from bodies such as the World Bank and with the support of FAO, today shrimp industries are increasingly being installed in tropical countries.

This activity has disturbed the population living off these ecosystems. Mangroves do not produce enough to support extractive activities by artisan fishers and at the same time the shrimp industry that is considerably undermining the ecosystem’s capacity for production, in most cases, degrading it in an irreversible way. One single company competes with the resources providing subsistence to a population. Over the years, the shrimp ponds drown in their own contamination, and are subsequently abandoned leaving a destroyed ecosystem and local communities impoverished to extreme limits. (WRM Bulletin Nº 51, October 2001).

Mangroves are life, long live mangroves

At present, mangrove forests cover an area of 181,000 km2, distributed in over 100 countries, but during the past 50 years, over 50% have been lost. Some direct activities are destroying mangroves or are degrading them, including substitution by other activities such as shrimp farming and agriculture, forestry, salt extraction, urban development, tourist development and infrastructure. Furthermore, other impacts include deviation of river water and contamination, caused by heavy metals, oil spills, pesticides and other products.

The establishment of shrimp farms has been the main cause of mangrove loss in many countries over the past 30 years. In Vietnam, a total of 102,000 hectares were converted to aquaculture between 1983 and 1987; in Honduras between 1986 and 1994, over 12,000 hectares were destroyed for the construction of shrimp ponds; in Ecuador over 180,000 hectares of shrimp ponds were built in mangrove areas; in Thailand, between 1961 and 1993, over 80,000 hectares of mangroves were destroyed to turn them into shrimp breeding ponds.

This loss of mangroves in the tropics has been facilitated on a major scale by international financial support, mainly provided by the World Bank and the Asian Development Bank. The International Financial Corporation approved, between 1997 and 2000, loans amounting to 82 million dollars for the development of aquaculture in Latin America. The "beneficiary" countries have been Belize, Mexico, Honduras, Ecuador and Peru.

One of the forces behind the mass loss of mangroves over the last decade has been the inability of economists to recognise the value of natural products and ecological services produced by this ecosystem. This has led to mangroves being considered as lands with no use, with no value and wasted and therefore subject to conversion to uses such as shrimp farming, generating products with a market value.

However, mangroves generate a wide range of natural resources and ecosystem services. Some of these services, such as protection against hurricanes and floods, reduction of erosion and maintenance of biodiversity, are key functions that sustain economic activities in tropical coastal areas. Forest products from mangroves, such as building materials, charcoal, tanin, drugs and honey are vital to subsistence and provide a commercial base for local and national economies. Coastal subsistence economies in many developing countries are strongly dependent on fishing from mangroves.

It has been established that each hectare of mangrove generates between 1,100-11,800 kgs of fisheries catches. This productivity is much higher than the 10-370 kg/ha/year found for coral reefs. In developing countries, the annual value of the fish market depending on mangroves varies between US$ 900 and US$ 12.400 per hectare of mangrove. It should be stressed that this value is based on a single good from the mangrove, that is to say, only fisheries. Additional efforts to estimate the economic value of forest resources and ecological services generated by mangroves, will demonstrate the significant value of this ecosystem and its support to subsistence and to local and national economies.

While this recognition regarding the value of mangroves and support by the authorities for their conservation is yet to be achieved, over the past few years, coastal communities have gone through one of the most critical times in all their history. Following decades or centuries of use of these ecosystems without any major conflicts, they are now facing the daily fact of seeing how two, twenty or sixty bulldozers, arrive on a "bad day" to destroy, in less than two weeks, what had been their subsistence and economy for generations. At the end of two months, all that is left are memories and an enormous amount of shrimp-breeding ponds.

Mangroves are being lost for ever and with them, the economies of hundreds of coastal communities, mainly coastal artisan fishers. This destruction is being extended day by day through all countries in the world having tropical coasts. In Latin America, from Mexico to Peru and Brazil, the shrimp industry does not stop. The efforts by coastal communities to defend their mangroves have cost the life of various artisan fishers in Mexico, Guatemala and Honduras. Presently grassroot movements are growing and to co-ordinate and detain the scourge, the "Mangrove Network" has been set up, aimed at providing all the coastal communities with a mechanism to co-ordinate efforts. During its first assembly held in September, the Mangrove Network achieved membership from organisations in ten countries of Latin America, with the objective of struggling with a single voice, Mangroves are life, long live mangroves. Justice for mangroves. (By: Elmer López Rodríguez, WRM Bulletin Nº 51, October 2001).

Unsustainable versus sustainable shrimp production

Most people that eat shrimp are unaware of where it comes from and about the impacts its production implies. Most of the commercial shrimp is either caught wild using destructive fishing methods, or produced in industrial shrimp ponds, which constitute the main cause of mangrove destruction.

According to FAO figures, 50% of the world's fisheries are already depleted. Jacques Diouf, General Director of FAO, has just alerted the delegates of more than 70 countries at a conference recently held in Iceland that oceans are over exploited and that it is urgent to guarantee their sustainable use. According to FAO data, in 1950 the total production of fish was 19 million tonnes. Fifty years later, a slightly higher amount (20 million tonnes) was wasted in the process of producing a total of 130 million tonnes.

Shrimp trawlers are among the most wasteful fishing boats in the world: they produce less than 2 % of the world's seafood, but are responsible for a third of the wasted fish bycatch. Up to 14 pounds of fish and other marine life are destroyed and discarded for each pound of shrimp harvested. Shrimp trawlers kill more turtles than all other human means combined in US waters.

This needless destruction is not much better in the case of shrimp farming. Shrimp aquaculture ponds are located in the most biologically productive and undervalued areas on earth: coastal estuaries, mangrove forests and wetlands, where shrimp naturally grows. Pond construction begins by cutting down the mangrove forests and digging diked ponds. Then, they are stocked with post larvae, mostly from hatcheries and nurseries at high stocking densities. In order to force the shrimp to feed continuously, the pond is lit all night. It is fed with formulated protein pellets and supplementary artificial feeds. To prevent from diseases, a number of chemical inputs as antibiotics, pesticides and detergents are also added. Pumped exchanges of water to remove wastes and to add clean oxygenated water is crucial to accommodate the high density stocking. This results in accumulation of wastes and degradation in the surrounding ecosystems leading to severe and irreversible problems.

In the short term, intensive shrimp farming is highly profitable for the companies. However, it is clearly unprofitable for the local communities living in the area where it is established, which results in major environmental and economic losses for the local people.

This destructive and polluting system can be avoided. Aquaculture has not always inflicted environmental harm. In fact, integrated fish and rice farming has been the backbone of traditional agriculture in Asia for centuries. This traditional system offers enormous potential for local food security and household nutrition. They also take advantage of the services that coastal ecosystems provide, such as filtering and purifying water, cycling nutrients, removing contaminants and buffering the land from coastal storms and severe weather. A study of the Matang mangrove in Malaysia revealed that its value for coastal protection alone, exceeded the value of farmed shrimp by 170 percent.

Silvofishery, an ancient coastal resource management concept might prove invaluable as alternative management. Silvofisheries is a low input sustainable aquaculture form of integrated mangrove tree culture with brackish water aquaculture. This integrated approach to conservation and utilization of the mangrove resource allows for maintaining a relatively high level of integrity in the mangrove area while capitalizing on the economic benefits of brackish water aquaculture.

However, it is important to underscore that the issue is not a technical one and that there are basically two ways of producing shrimp. One is based on the appropriation and destruction of mangrove areas, the pollution of the same and neighbouring areas and high corporate profitability at the expense of local peoples' territories and livelihoods. The other approach aims at the sustainable use of natural resources – among which shrimp is but one – for the benefit of local communities. If environmental protection and social advancement is to have a meaning, the latter system is clearly in the right direction. (WRM Bulletin Nº 51, October 2001).

Environmental, social and economic impacts of shrimp farming

The destruction of mangrove forests implies the loss of unique species. Mangroves link the tropical forests with the coral reefs, providing a critical transition between terrestrial and marine ecosystems. They also protect shorelines from erosion, capture sediments – thus protecting coral reefs – and are the spawning grounds for the majority of tropical commercial fish. They also protect coastal lowland rainforests from tropical storms. They are critical to local biodiversity, harbouring plants and animals totally unique to mangrove ecosystems. They are also used for recreation and tourism. They are extremely biologically productive and for local communities mangroves are an important source of fuel, medicines, food, fodder, etc.

Apart from the fact that vast areas of mangroves are cut, another consequence of industrial shrimp farming is that there is a vast volume of waste produced inside the ponds by the shrimps. Feed eaten by shrimps but not retained in their body ends up as waste. As the waste piles up, bacteria flourish and consume the available oxygen. This can suffocate the shrimps and reduce their growth. Intermediate waste products – both of shrimp and microbes – such as ammonia and nitrite, are toxic to shrimp, fish and other animals. Shrimp weakened by waste and lack of oxygen is more susceptible to disease. In order to avoid this problem, the water from inside the ponds is regularly removed out and the ponds are filled in with clean water. This system results in the pollution of the neighbouring surface waters.

This activity also provokes the salinization of coastal aquifers and agricultural lands. When the ponds are abandoned due to disease or other causes, the area is often left as a wasteland and the soils contain high levels of salinity, acidity and toxic chemicals, which make other uses practically impossible.

Another consequence of industrial shrimp farming is the use of antibiotics, pesticides, fungicides, parasiticides, and algicides. To guard against diseases farmers also use a large amount of antibiotics during production as well as toxic chemicals between harvests to sterilize the ponds. The result is that human consumers of tropical shrimps produced in this way are eating food containing high levels of antibiotics. Many of the substances used in this activity are prohibited in some countries due to their carcinogenic effects. Regarding antibiotics, some of the ones that are used in shrimp farming are the ones used in humans, which might decrease the effectiveness of antibiotics against diseases. It is important to highlight that in many of the producer countries there are no regulations limiting the amount of chemicals used.

In the quest for profits, the idea of using genetically modified shrimps is already being taken on board and Thailand –the world leading producer – has started research in this area. The idea is to develop a super-shrimp. If this were to succeed, consumers – apart from eating antibiotics, pesticides and other chemicals – would be also eating GM Shrimps.

Among the social and economic impacts of this activity, the destruction of mangroves entails the destruction of an ecosystem which is of great importance for local communities, which of course do not share the profits! Aquaculture is said to be a viable response to the problem of food resources especially in the poor countries. This is clearly not the case of shrimp farming. It is also said that it is a source of much needed foreign exchange, enabling shrimp producing countries to import lower cost protein thus ensuring food security. This argument present two problems. Firstly, that there is no evidence that the foreign exchange earned by shrimp farmers will be used to purchase cheap imported protein. The foreign exchange is earned not by the poor but by the rich shrimp farm owners who decide on how to spend it. Secondly, dependence on imported food reduces food security in times of currency instability.

Regarding employment generation shrimp aquaculture – due to its industrial nature – employs fewer people than agriculture or other fishing activities.

In many cases, shrimp farming has resulted in serious human rights violations, including murder, physical injuries, eviction of villagers, detention of workers in shrimp farms, violation of shrimp farm workers' rights, and confiscation of land, forest and water resources.

Displacement of local communities is common in shrimp exporting countries, where politically connected investors turn highly productive complex ecosystems into a single use private domain. The many poor people who depend on mangrove and coastal fisheries for their livelihoods are eventually displaced. Conflict over land tenure rights are at the core of the conflicts related to shrimp farming.

Shrimp farming is a profitable business for a small group of people, and it is profitable because liberalized trade does not take into account the so called "externalities". This means that those who make the profits do not pay for the destruction of the ecosystem, while tremendous costs are being unwillingly absorbed by local communities at whose expense the industry makes its profits.

In sum, industrial shrimp farming is not only not a solution, but aggravates socioeconomic disparities within the framework of environmental destruction. (WRM Bulletin Nº 51, October 2001).

The pillars of increased global shrimp trade

Globalisation has encroached upon our table. Foods are trailed all along the seas, from South to North and from East to West. The farther, the better (for transnational companies) because that implies trade, packing, conservation processes, tariffs, importers, exporters, and so on.

Nowadays, there are tropical fruits available in cold countries' markets, or fish and seafood in landlocked regions. And the list goes on. This is shown as a sign of progress and more choices for the people... Actually, it's just global trade. More precisely, the internationalisation of "free" trade, with reduced tariffs, quotas and non-tariff trade barriers to provide exotic products to lucrative markets. And the World Trade Organization (WTO) –the global institution chartered to regulate global trade – together with international agencies and banks (FAO, World Bank, etc.) behind all that, fostering an intensive production-demand pattern. Developing countries become the suppliers through increased loans and credits from lending institutions, which typically finance intensive monoculture production systems.

Such is the case of the shrimp trade. Shrimp consumption is quite expanded in the US, Europe and in some Asian countries. The landings of wild shrimp from "capture" fisheries have hovered between 2 to 3 million tons a year. For some developing countries, the trade in seafood products is greater than that of coffee, tea, rubber, and banana combined.

In the 1980s, the development of shrimp aquaculture – which has meant the conversion of huge parts of tropical mangrove forests into aquaculture ponds – allowed a dramatic increase of shrimp consumption as well as plummeted shrimp prices. For example, many US restaurants now offer cheap all-shrimp menu and all-you-can-eat shrimp bars of what was once an expensive delicacy.

Intensive export-led shrimp farming – with a short term, high rate of return on investment – and cheap supply – at the expense of degraded environment, displaced communities, loss of traditional livelihoods, human rights violations – are then the pillars of a global shrimp trade which on the other hand has also implied overfishing and depletion of the seas. In between there is a full battery of vested corporate interests.

The promoters of global trade maintain that trade is neutral with respect to the environment, society, sustainable management and economic efficiency. Nothing more distant from reality. Trade can have positive or negative effects but cannot be sustainable without sustainable production. Export-oriented industrial shrimp farming has already proven to be socially and environmentally unsustainable and must therefore be stopped before it results in further damages to people and their coastal ecosystems. (WRM Bulletin Nº 51, October 2001).

Shrimp aquaculture in international environmental treaties

The ecological and social impacts of shrimp aquaculture have been brought to the attention of two international environmental treaties that have been developing policies and programmes for the sustainable management of coastal and other ecosystems. These are the RAMSAR Convention on Wetlands and the Convention on Biological Diversity (CBD).

The Forest Peoples Programme, an ISA Net (Industrial Shrimp Action Network) member organisation, made an intervention highlighting the impacts of shrimp farming on coastal and marine ecosystem and local communities at the Conference of the Parties 4 (COP4) of the CBD in May 1998 in Slovakia.

The following year several ISA Net members participated in the 7th Conference of the Parties of RAMSAR and at a workshop on Indigenous Peoples and Local Communities' Participation in Wetland Management during the 13th meeting of the Global Biodiversity Forum (GBF) which preceded the RAMSAR meeting (San José, Costa Rica, 7-18 May, 1999). The presentations made by four representatives of local communities were well received at the GBF and ISA Net's recommendations were discussed at the RAMSAR Conference. As a result, a paragraph was added to one of the final resolutions (Resolution VII.21, Enhancing the conservation and wise use of intertidal wetlands), calling for the suspension of the promotion, creation of new facilities, and expansion of unsustainable aquaculture activities harmful to coastal wetlands until measures aimed at establishing a sustainable system of aquaculture that is in harmony with the environment and local communities are identified.

ISA Net members also participated in discussions and amendments of the Guidelines for establishing and strengthening local communities' and indigenous peoples' participation in the management of wetlands, which were eventually adopted as Resolution VII.21 and VII.8 of the COP.

Getting useful language into international conventions, however, can only be considered an achievement if they become effective tools to be used by local organisations in their efforts to protect their environment and livelihoods. NGOs and CBOs in Ecuador and Honduras have so far tried to use the paragraph on aquaculture of RAMSAR Resolution VII.21 in order to stop further expansion of shrimp farming in ecologically sensitive coastal ecosystems. So far, it seems that the RAMSAR language might have been helpful in supporting the effort of Ecuadorian NGOs trying to stop the introduction of new policies that would have included the privatization of parts of the coastline for the benefit of shrimp farmers. On the other hand, it does not seem to have been particularly useful in the Gulf of Fonseca, Honduras, despite the fact that part of the Gulf is a RAMSAR site. Effective follow-up needs to be organised to make sure that language developed in RAMSAR does not remain empty words.

Meanwhile, a programme under the CBD, namely the Jakarta Mandate on Coastal and Marine Biodiversity, has developed a 3-year work plan for the conservation and sustainable use of marine and coastal biological diversity. This includes a section (programme element 4) on mariculture, whose main operational objective is to assess the consequences of mariculture for marine and coastal biological diversity and promote techniques that minimise adverse impact. How effective the work plan is going to be still remains to be seen. (By: Maurizio Farhan Ferrari, WRM Bulletin Nº 51, October 2001).

Tropical prawns versus mangroves

The Ramsar Convention on Wetlands was signed in the city of Ramsar, Iran, in 1971 and entered into force in 1975. Ramsar is the only environmental convention that addresses a specific ecosystem, that of the wetlands. Wetlands, as recognised by the Ramsar Convention, fulfil essential ecological functions, as regulators of hydrological regimes and as habitats for a very rich biodiversity and are a resource of great economic, cultural, scientific and recreational importance that must be preserved.

Mangroves, coastal forests located in tropical and equatorial areas of the world, are part of these wetlands. They are presently seriously threatened. According to FAO, over 50% of the mangroves have already disappeared. Today the main cause of mangrove loss is the expansion of the shrimp industry, breeding shrimps or tropical prawns in coastal areas of poor countries to export them to rich countries such as Spain, the United States or Japan. In fact, most of the prawns found today on the market are a product of the destruction of coastal ecosystems in the countries of the South and of the displacement of local populations.

Resolution VII.2, taken at the Seventh Conference of the Parties to the Ramsar Convention on Wetlands (Costa Rica, 1999), recognises the economic, social and environmental value of the wetlands such as mangroves for fishing, biodiversity, coastal protection, leisure activities, education and water quality. It recognised that the subsistence of a considerable number of populations depends on the productivity and value of wetlands located in inter-tidal zones and also showed concern over the advanced process of degradation that is to be found in many coastal wetlands, mainly as a result of unsustainable aquaculture and contamination.

In view of the above, the Convention urged the Contracting Parties -- that is to say, the States -- to suspend the promotion and creation of new facilities for unsustainable aquaculture activities, damaging to coastal wetlands, including the expansion of already existing facilities, until measures aimed at establishing a sustainable aquaculture system, in harmony with the environment and local communities can be identified, by means of environmental and social impact assessments on such activities and through appropriate studies.

Unfortunately, this resolution is not being implemented. For this reason, Greenpeace and the Mangrove Network (Redmanglar) (a network gathering NGOs from Ecuador, Honduras, El Salvador, Guatemala, Mexico, Brazil and Colombia working in defence of mangroves) will submit a very concrete demand regarding mangroves: a moratorium on the expansion of the shrimp industry, to the Eighth Conference of the Parties to the Ramsar Convention, to be held in November, in Valencia (Spain).

Without this stoppage, we will be unable to save these ecosystems and we will prevent the local populations that depend on them from having a different opportunity -- other than poverty or migration. Perhaps the Eighth Conference of the Parties to the Ramsar Convention is one of the last opportunities to curb the destruction of the only forests that can live with their roots in the sea. (By: Eva Hernández, WRM Bulletin Nº 64, November 2002).

NETWORKING FOR MANGROVE PROTECTION

Civil society organizations and concerned individuales play a major role in environmental protection in general. In the case of mangroves, their work is essential to both ensure support to local struggles and to influence national and international decision-makers to create conditions leading to mangrove protection. In this respect, networking is an important tool to achieve those aims. Two of those networks – one international and one regional – are described in this section.

Global Group Formed to Counter Destructive Industrial Shrimp Farming

Wetland forests and coastal areas are being recognized as ecosystems of great ecological, economic and social values. Despite the fact that the debate for their protection has been increasing over the last few years, the pressure for the development of unsustainable projects affecting these ecosystems continues to cause severe damages. The conversion of large tracts of mangrove forests, lagoons, marshlands and other coastal and inland ecosystems to intensive shrimp farms has been fuelled by an increasing demand for shrimps in northern countries, especially Japan, USA and Europe. Although local communities and environmental groups in the affected countries have been highlighting the destructive and fast-expanding nature of the shrimp industry, the vast majority of consumers in the North are totally unaware of the impact that their rising demand for shrimps is having on local communities and coastal and inland ecosystems in producing countries.

Representatives of major environmental and community organizations from 14 nations agreed to create an umbrella group to oppose the continued expansion worldwide of destructive industrial shrimp farming. The new group – formed on World Food Day, October 16th 1997 – is called the Industrial Shrimp Action Network (ISA Net). ISA Net is composed of NGOs, community organisations and concerned scientists from Southern and Northern countries. Its main aims are to support local communities and launch a public awareness campaign in consumer countries. As a conclusion of the Forum the following statement was adopted:

"We are a global network of organizations and individuals, representing community, environmental, and scientific concerns. We are opposed to the expansion of destructive industrial shrimp farming with such consequences as impoverishment and displacement of local communities, degradation of mangrove forests and other coastal and inland ecosystems, loss of agricultural land, pollution, and the loss of cultural and biological diversity.

We have joined together:

- to recognize, support, and empower communities threatened by shrimp farming to enable them to control the use and management of coastal resources to meet their food, livelihood, cultural, and other basic needs;

- to educate consumers about the social, economic, and environmental costs of shrimp production so that they can make informed decisions about purchasing and eating shrimp;

- to resist destructive industrial shrimp production practices and policies and encourage the adoption of ecologically responsible and socially equitable alternatives by industry, local communities, national governments, and international institutions;

- and to identify and encourage better coastal resource management and support the restoration of ecosystems degraded by industrial shrimp farming." (WRM Bulletin Nº 6, November 1997).

The Latin American Mangrove Network is born

Thirty delegates from 10 Latin American countries met at Choluteca, Honduras, from 27 to 30 August to establish the REDMANGLAR (Mangrove Network). Its main objective is to defend mangroves and coastal ecosystems, to guarantee their vitality and that of the populations who relate with them, from hazards and impacts of activities, mainly industrial, likely to degrade the environment.

The REDMANGLAR has the following objectives:

1. To halt the expansion of inappropriate economic industrial activities in coastal ecosystems as they are considered to be destructive.

2. To strengthen the overall development of local communities and their grass-roots organizations and promote exchange, knowledge and experience.

3. To restore remaining mangrove areas and degraded coastal ecosystems, abandoned or illegally occupied by industries, and reincorporate them for community use, management and custody.

4. To denounce and halt attempts to legalise and internationally fund industrial aquaculture, tourist industries and others.

5. To ensure strict compliance by States, governments and companies with the laws and compensation for damage caused to communities and ecosystems.

6. To demand that governments adopt policies and issue laws and other legal instruments, complying with them in conformity with international treaties to enable the conservation of mangroves and coastal ecosystems.

7. To disseminate, promote and link local efforts in defence of natural resources and local communities.

8. To implement awareness and training programmes on the value of mangroves and coastal ecosystems at national and international levels.

9. To promote international solidarity in support of REDMANGLAR objectives as a principle and strategy.

10. To denounce those industrial activities which are presently strongly affecting mangrove and coastal ecosystems, mainly shrimp farming and industrial tourism.

The Executive Secretariat of this network will be located in Honduras (Coddeffagolf) for the next two years. (WRM Bulletin Nº 50, September 2001).

INSIDE THE MANGROVES

This sections includes a wide variety of situations in mangrove areas throughout the tropics. Some describe the problems while others focus more on struggles. While there are clear similarities in some aspects, it is also true that every article adds new issues or perspectives, thus enabling the reader to reach a deeper understanding – article after article – about the issue.

- AFRICA

Kenya: Mangroves threatened by Canadian mining company

The Kenyan coast is estimated to hold more than 10% of the world's unexplored deposits of titanium, a metal used in the pigment industry, and increasingly in the manufacture of many objects of modern life. A drilling recently performed in the Kwale area delineated a reserve of 150 million tons of sands containing rutile, ilmenite and zircon, the minerals used to make titanium.

This is very bad news for local communities living along the mangrove coast nearby Mombasa, such as those of Tsunza village, which are being threatened by a planned massive titanium mining development by a Canadian firm. The possible transformation of thousands of acres of farms and

forests on the Kenyan coast into a titanium mine has sparked criticism among local community leaders. Since foreign companies operating in the mining sector in the South do not adhere to the same business and environmental standards as in their home countries, it is feared that the project will cause the rapid destruction of this valuable ecosystem. The Canadian mining industry in particular has expanded significantly overseas during the past decade provoking severe impacts both on forests and forest peoples. (WRM Bulletin Nº 38, September 2000).

Madagascar: Mangrove importance and threats

Located to the East of Africa, Madagascar is the largest island in the Indian Ocean and its fauna and flora are highly endemic. Mangrove forests cover an area of 327,000 hectares, composed of seven tree species accompanied by an extremely diverse fauna.

The Baly Bay case is useful to understand the situation of mangroves in this country. The Baly Bay is located to the West coast of Madagascar. In 1997, 69,350 hectares were classified as a National Park, but including less than 500 hectares of mangroves, which in the region comprise a total of 7,200 hectares. Many species of animals use this habitat as nesting, roosting and feeding areas. Among the nine threatened and endemic Madagascar waterbirds species, five are recorded inside the mangrove (*Ardea humbloti*, *Anas bernieri*, *Threskiornis bernieri*, *Haliaeetus vociferoides* and *Charadrius thoracicus*). For mammals, two species are recorded inside the bay as the Madagascar bat *Pteropus rufus*, roosting on mangrove trees and *Delphinus sp*. In addition, mangroves constitute an important habitat for invertebrates. The most economically important is the crab *Scylla serrata* and two shrimp species: *Penaeus indicus* and *P. monodon*.

Those mangroves are an important source of income, not only for the country but also for the local population. The mangrove trees are used in building and to a lesser extent as firewood. The traditional and industrial fishing activities are practised inside the bay mainly based on the two shrimp species. The collection of crabs is carried out all year round to feed the local needs. The local population has for many years been involved in these activities, which have resulted in very low impacts on the ecosystem.

In recent years, shrimp has become one of Madagascar's main exported sea products. As a result, the Baly Bay region has become involved in this new tendency by establishing 600 hectares of a semi-intensive shrimp farming industry since 1998.

Compared to others ecosystem types (e.g. forests, lakes), mangroves are one of the less studied habitats in Madagascar, while the increase of the communities' needs and especially the development of shrimp farming are at a critical level. Although the impacts of these activies on mangroves are still difficult to identify due to lack of information, fishermen using traditional methods recorded that the proportion of catches of the two shrimp species (*Penaeus monodon* and *P. indicus*) jumped from less than 1/ 10 before 1998 to 1/ 4 in 2000. The causes of this change and other unexpected effects need to be identified and addressed to limit their impacts on biodiversity.

In Madagascar, the exploitation of mangroves for shrimp farming has increased considerably during the last ten years. At the same time, the strong demographic growth in the Malagasy western area may accentuate the ecosystem's degradation, thus simultaneously threatening biodiversity and the riparian community's livelihoods. Studies should be conducted to improve understanding of the relationship between exploitation and biodiversity conservation in order to avoid ecological disasters. Actions such as the ecological monitoring carried out in the Baly Bay region in 2000, require strong collaboration between the company, local communities, academia and relevant authorities, in order to achieve the conservation and sustainable use of resources. The reinforcement of the applied Malagasy decree related to the compatibility of investments with the environment (MECIE-Mise en compatibilité des investissements avec l'environment), followed by the implementation of ecological

monitoring in areas under strong exploitation are essential. In addition, the priorisation of research programmes should be focused on understanding the ecosystem's functioning as the starting point to achieve conservation. (By: Rabarisoa Rivo, WRM Bulletin Nº 51, October 2001)

Nigeria: Threatened mangroves

Thousands of hectares of mangrove forest and fresh water swamps of the Niger Delta, in the Cross River State, will be destroyed by ongoing oil exploitation activities. Responsible for the situation are the companies Moni Polu Nigeria Limited, that in early 1998 started its oil prospections in the area, and Nobles Drilling, which was contracted to start drilling oil wells. By December 1998 about 8 oil wells had been sunk. A 1000 km long pipeline, that will pass through over 25 communities, has also been programmed. In spite of the letters of protest sent by Nigerian environmental NGOs to the firms involved and to the national authorities, the new phase of the project will start without the accomplishment of the required Environmental Impact Assessment.

Oil prospection and exploitation are known worldwide for their negative environmental and social impact at the local level: loss of indigenous peoples' or peasants' lands, health problems, destruction of rainforests, pollution of water sources and air. At a global level, more extraction means more fuel consumption and liberation of CO2 to the atmosphere, the most relevant gas causing global warming. In the specific case of Nigeria, the military intimidate local populations, burn their houses and even kill the villagers that resist oil related activities in their lands. Several cases of human rights abuses have been denounced, as testified by the long struggle of the Ogoni people against Shell in Ogoniland and the most recent facts involving Chevron in the Delta State.

Oil industry is a very important factor of mangrove destruction in Nigeria, but not the only one. The Federal Government is suspected of having recently awarded a contract for the dredging of the upper River Niger from Warri to Baro, in the northern region of the country. Since mangroves are fragile forest ecosystems highly dependent on continuous water feeding, this project could gravely affect them, which could bring about the loss of livelihoods for their inhabitants. It is feared that the Niger Delta area, situated downstream of the location of the dredging project, and which has suffered for years much environmental degradation and social conflicts due to the activities of the oil industry, is further compounded with the works to be undertaken.

Nigeria has lost between 70 and 80% of its original forests and nowadays the area of its territory occupied by forests is reduced to 12% even if the entire country is located in the humid tropics. Having the largest population in Africa (115,000,000 inhabitants in 1996) it registers levels of 40% of illiteracy, while GNP per capita is only US$ 240. The authorities seem to ignore this reality and prefer to devote funds and efforts to megaprojects as the above referred, regardless of the real needs and aspirations of local communities. (WRM Bulletin Nº 22, April 1999).

Nigeria: Oil and violence

Oil exploitation is responsible for the destruction of mangroves, local community displacement and suffering, as well as environmental degradation of water sources and soil in Nigeria. This depredation is usually accompanied by brutal actions against local community members and activists, during which armed corps constitute the executive arm of the companies. The Niger Delta is an area where oil prospection and exploitation are especially active. Environmental destruction and human rights abuses in this region to the hands of Shell and Chevron have been repeatedly denounced.

On April 1999 the Ekebiri communities of the Southern Ijau Local Government Area of Bayelsa were victims of the violence displayed by a group of soldiers, under the control and direction of Nigeria Agip Oil Company (NAOC). Ekebiri is a clan of three communities – Ekibiri I, II, and Opuadoma – with 32 other satellite villages, with an estimated population of about 10,000 people. NAOC has been

responsible for several human rights abuses in the Niger Delta. The company has even been accused by several of its host communities for instigating ethnic clashes amongst them as a way of weakening their resistance.

The events leading to the blood-bath started when the communities demanded from NAOC a compensation for the incessant spillages that have occurred in their territories, since 1969, the last being in 1997, and in which the company refused to pay. At the beginning of 1999 the company went into discussion with the communities but refused to pay the demanded sum. The discussions then broke down and the communities took steps on April 17 to enforce their demand by closing down the company's 2 manifolds in their communities. The following day NAOC took a military escort and reopened the shut manifolds, what was resisted by the villagers. The soldiers then opened fire into two boats, filled with unarmed youths and chiefs of Ekebiri I and II, who where on their way to a meeting with the Commissioner of Police of Bayelsa State. Eyewitnesses said that the shooting lasted for about 40 minutes and the soldiers shot the fleeing youths and chiefs until they landed on their community waterfront. Some were shot dead right on the community water bank while scrambling to run into their community. On hearing the gun shots, the entire villagers ran for their safety and deserted the village. As a result of this brutal action eight people were killed, two chiefs arrested and the boats seized.

The Nigerian Agip Oil Company Ltd. has produced crude oil in this region since 1969, but despite these two decades of oil exploration and generation of huge benefits for the company, the local population has remained poor. And their environment destroyed.

The Niger Delta Human and Environmental Rescue Organization (ND-HERO) is worried over the extent of impunity of Agip in dealing with oil producing communities. Agip is considered the worst company ever regarding environmental degradation and human rights abuses, seconded only by Elf Aquitaine.

ND-HERO demanded government to take urgent steps to bring Agip and the soldiers involved in these atrocities to justice and for Agip to abandon the use of the military in suppressing communities, and the instigation of ethnic struggles amongst the Niger Delta communities. (WRM Bulletin Nº 23, May 1999).

Nigeria: People protect mangroves against shrimp farming

The Nigerian area of saline mangrove swamps stretches through the coastal states with 504,800 hectares in the Niger Delta and 95,000 hectares in Cross River State. The mangrove forests of Nigeria rank as the largest in Africa and as the third largest in the world.

The Niger Delta has provided the best conditions for the thriving of vegetation on the Nigerian coast. Many of these areas are truly representative of untouched mangrove forests, as well as being reserves that protect unique and threatened valuable species. By some estimates, over 60% of fishes caught between the Gulf of Guinea and Angola breed in the mangrove belt of the Niger Delta.

Typically, these are fragile ecosystems which can be easily destroyed by unsustainable human interventions such as oil exploration, exploitation and transportation processes.

The inhabitants of historical settlements in the Niger Delta depend on fish and other mangrove resources for their livelihood. Mangrove wood is still a multi-purpose resource for fish stakes, fish traps, boat building, boat paddles, yam stakes, fencing, carvings, building timber and fuel.

Although there is an institutional framework for the management of forests and wildlife, existing legislation is either obsolete or ineffectively enforced. Some areas have been proposed for wetland conservation but none of the proposals have been implemented.

Current problems for mangrove conservation include urban development, coastal erosion, oil pollution, gas flaring as well as the replacement of native mangroves by the exotic palm *Nypa fruticans*, which has been identified as an ecological disaster deserving urgent attention.

Now, a new menace looms on the Nigerian horizon: industrial shrimp farming. Sponsored by the International Finance Corporation (IFC), a branch of the World Bank, the Shell Petroleum Company of Nigeria Contractors will receive funds to develop this activity with the support of the Nigerian President.

The Mangrove Forest Conservation Society of Nigeria, together with other NGOs and CBOs – Rights Action, Friends of the Earth Nigeria, Eni-Owei _OU-Degema, ECO-out reach, Agape is a birth right, Niger Delta Project for Environment, Human rights and Development (NDPEHRD), Civil Liberty organization, Ijaw Council for Human Right (ICHR), Niger Delta Protect League (NDPL), Okoloma Forum and Kalio-Ama Ecological Foundation – are opposing the project and propose a rejection/moratorium on the IFC Credit Loan facilities to Shell Contractors without consultation. They will also draw up a programme to reverse presidential or any other support for shrimp farming. (WRM Bulletin Nº 51, October 2001).

Tanzania: Mangroves menaced by aquaculture project

The Rufiji Delta in South Eastern Tanzania is one of the largest blocks of mangrove forests in East and Southern Africa. It covers an area of about 53,255 hectares of unspoiled mangrove forest, that support a large number of people, and is rich in aquatic as well as terrestrial biodiversity. The delta is linked to the interior of the river system by an extensive flood plain covering about 130 km long and up to 20 km wide. It is also linked to a system of ocean currents and coral reefs surrounding Mafia Island in the East and it influences fisheries production in the island through the northerly flow of marine currents.

Mangrove forests of the Rufiji Delta also stabilise the coastline by preventing coastal erosion, build land through accumulation of silt and the production of detritus, preserve the purity of water by absorbing pollutants from upstream sources and serve as windbreaks for the hinterland.

The Rufiji communities that rely on fish, mangrove poles and rice farming have made an ancestral sustainable use of this area. A proposed industrial prawn project by the African Fishing Company purported to use semi-intensive production methods would privatise one third of the Rufiji Delta. From experiences in other parts of the world, on average, semi-intensive prawn farms fail after about ten years. This eventually will therefore threaten the lives of thousands of local farmers and fishermen living in the delta; with severe environmental implications to the ecology and irreparable damage.

A proposal to establish the same by Coastal Aquaculture at the Tana delta in Kenya – an area with ecological features similar to those of Rufiji Delta – is still unresolved since mid 1992. The company purchased 10,000 hectares of land for this purpose. Later the land allocation was nullified by the Kenyan government through a presidential directive declaring the Tana Delta a wetland of international importance. However the Coastal Aquaculture company challenged this decision in court after which the high court ruled in their favour in 1996, meaning that the company may proceed to develop the 10,000 hectares for prawn farming.

In spite of their sustainable use of natural resources and adequate management of the environment, local communities are usually left out when resource management plans are being made. That is why

more than 2000 Rufiji Delta residents filed a chamber application with the Tanzanian High Court seeking for permission to sue the government for endorsing the prawn farm project which will affect their economic well being. They argue that this aquaculture project will deny them access; through plans that are underway to fence off the prawn project area; to the natural resources including prawns, fish and other marine resources with which they have coexisted from time immemorial. They further state that the decision to allow the project to go ahead was taken without taking into account the environmental hazards the project will cause to the area. Furthermore the decision to undertake this "development" project was taken without their consent and involvement.

Local NGOs JET (Journalists Environment Association of Tanzania) and LEAT (Lawyers' Environmental Action Team), have been and still are the mainstay NGOs in Tanzania openly opposing this project. There was recently a meeting between EAWLS (East African Wild Life Society), JET, and other NGOs in Tanzania regarding the Rufiji Delta. Plans were being made to hold a 2nd East African Regional Workshop which will highlight present concerns regarding both Rufiji Delta in Tanzania and Tana Delta in Kenya. (WRM Bulletin Nº 12, May 1998).

Tanzania: Impasse on commercial shrimp farming at Rufiji Delta mangroves

On April 1999, Tanzanian NGOs were able to secure an interim order staying plans of the African Fishing Company's 10,000 hectare shrimp farm project at Rufiji Delta. Would the project have been implemented, one third of the whole Rufiji Delta would have ended up in the hands of the company for a period of no less than ten years, thus threatening the livelihoods of thousands of local farmers and fisherfolk living in the delta, and causing severe environmental impacts that would have put at risk the future of the region.

The panel of three judges chosen to hear and dictate on the case disintegrated when one of its members retired and another one was transferred. The case has not yet been assigned to another panel and it appears that at present there are not enough judges to constitute a new one. In the meantime, the company is said to be facing severe financial constraints which would have even forced it to sell part of its assets. Although the situation is not yet clear, it seems that the efforts carried out by concerned citizens and organizations have managed to save -- at least for the time being -- the mangroves and local peoples' livelihoods. (WRM Bulletin Nº 40, November 2000).

Tanzania: The death of the Rufiji Delta Prawn Project

The plans to build the world's largest shrimp aquaculture facility in the Rufiji Delta of Tanzania have encountered strong opposition from local people.

The Rufiji Delta, located about 150 km South of Dar es Salaam, contains the largest continuous block of mangrove forest in East Africa, comprising some 53,000 hectares. The Delta supports the most important fishery in Tanzania's coastline, accounting for about 80% of all wild-shrimp catches in the country. The Delta is home to approximately 41,000 people, many of whom are small farmers and traditional fishers. It provides important habitat for endangered animals and plants.

In 1997, the government approved a proposal by the African Fishing Company (AFC) to establish almost 20,000 hectares of shrimp farms there. The AFC wanted to use "public" land in the Delta to create shrimp ponds, hatchery, a processing plant, and a feed mill. Thirty-five percent of these facilities would be located within a "mangrove forest reserve", and the hatchery would be located on Bwejuu Island, which is part of the Mafia Island Marine Park.

The driving force behind the proposed project was the harvest of 6,210 kilograms of prawns per hectare per year which would be expected from the farm, with most exports going to Europe and

Japan. The business would allegedly produce US$ 500 million a year in export profits, but social and environmental experts said the damage to the environment would far outweigh the profit.

The National Environmental Management Council (NEMC) – the environmental advisory body of the Tanzanian government – urged the government to reject the project on the grounds that it would have considerable negative impact on forestry, fisheries and marine environment, land use, water resources, as well as agriculture and wildlife. It would destroy 1,200 hectares of mangroves, including rare species such as Rhizophora and threaten habitats of a variety of endangered species. The proposed aquaculture operations would generate substantial pollution which would cause increased eutrophication, toxicity, and acidification of surrounding water resources.

In spite of NEMC's recommendation and over the objections of Tanzanian and international NGOs and agencies, the Tanzanian Cabinet approved the project. John R. Nolan, the majority shareholder of AFC, had also wanted to set up (in the Rufiji Delta) a fish mill and a fish processing factory all aimed at the Japanese, European and North American markets.

The project was strongly opposed by Tanzanian environmentalists, most notably the Journalist Environmental Association of Tanzania (JET), international environmental organisations, and local residents. From July 1997 to date, JET members have led the discussion on the negative impacts of shrimp aquaculture. Recently, 2,000 Rufiji Delta villagers filed an application with the Tanzanian High Court for permission to sue the Government to challenge the approval of the AFC project, and there is also another case pending in Court, filed by over 2,000 former employees of the company.

Finally, it seems that all those years of resistance to a damaging project have borne fruit. On August 15, 2001, it was announced in the press that the fishing vessels of AFC were to be sold through a tender team supervised by the High Court of Tanzania, apparently to offset part of the company's huge debt, accumulated over the years by the Rufiji Delta Prawn Project as a result of the opposition of local people to its implementation. The liquidation of the company implies that the project has been halted, thus ensuring the survival of Tanzanian mangroves and preservation of their social, economic and environmental services. (WRM Bulletin Nº 51, October 2001).

- ASIA

Bangladesh: Mangroves menaced by oil and gas companies

In Bangladesh the remaining virgin rainforests are near to extinction. The whole Bangladesh mainland and its off-shore areas are gradually being leased for oil/gas explorations. Even the Sundarbans, considered a world heritage and the largest mangrove forest of the globe and only remaining habitat of royal bengal tiger is being occupied by the exploration activites of oil/gas companies.

The affected area is one of the 23 blocks into which the government divided the national territory for the oil/gas exploration activities by foreign multinational companies. The measure has already been implemented in nearly half of the country area and is affecting several ecosystems rich in biodiversity, like the virgin forests of the hilly eastern part of Bangladesh, streched from the Himalayas to the Bay of Bengal.

The Sundarbans is a vast tract of mangrove swamp forest situated on the southwest corner of Bangladesh and forming the lower part of the Ganges Delta. The name 'Sundarbans' is derived from the term "Sundari", a reference to the large mangrove tree that provides valuable fuel. It extends for about 160 miles (260 km) along the coast of the Bay of Bengal from the Hugly river Estuary in India to the Meghna River Estuary in Bangladesh.The whole tract reaches inland for 60-80 miles (100-130 km). A network of tidal rivers and creeks intersect numerous islands. Along the coast, the forest passes into a mangrove swamp; which is virtually uninhabited. It is one of the last reserves of the royal

bengal tiger and the site of tiger preservation project. In addition, it supports other mammals, more than two hundred species of birds, as well as crocodiles, other reptiles and amphibians. The Sundarbans is also important for its estuary fisheries and for being a safe winter quarter of several hundred migratory birds. The cultivated northern area yields rice, sugarcane, timber and betel nuts, etc. This unique mangrove forest, comprising a more than 10,300 square kilometre area, has been earmarked as Block Nr. 5 in the government's division. It has been leased out to Shell Oil & Cairn Energy for oil/gas exploration. Friends of the Earth-Bangladesh is seeking international support to halt Sundarbans destruction. (WRM Bulletin Nº 15, September 1998).

Bangladesh: Polder 22, The struggle to protect the Sundarbans

On November 7 1990, Koronamoyee Sardar was killed by an armed gang of hired thugs whose aim was to set up a shrimp farm at Horinkhola Polder 22. The local villagers, led by Koronamoyee, resisted this invasive force. On that fateful day, Koronamoyee became a martyr for her cause, and in the eyes of her people she remains their heroine in their decade long ongoing struggle against the surrounding oppressor.

The supreme sacrifice of Koronamoyee is not forgotten. Every year, on November 7th, there is a great celebration at Polder 22, where thousands of resisters peacefully gather to commemorate this brave woman who led a successful movement of the people against a powerful, unscrupulous industry. Today, Horinkhola Polder 22 is the only remaining shrimp farm-free village in the shrimp farming district of Khulna. A great battle was won, but the war continues.

When Mangrove Action Project's Director visited the Sundarban region last month during the recent Steering Committee meeting of ISA Net, he was especially impressed with two things: the dwindling extent of the largest remaining mangrove forest in the world and the great courage of the farming community of Horinkhola Polder 22 whose stalwart members have been resisting for over a decade the unruly insurgence of the shrimp farming industry surrounding their community. Polder 22 is like a war zone – an island of steadfast resistance in a tumultuous sea of industrial greed and corruption. Polder 22 is that last bastion of brave combatants who will fight to the very last soldier in this winless war upon our Mother Earth.

Horinkhola Polder 22 is both an inspiration and a blessing in this earthly existence we call life. Without such resistance against such open tyranny, what worth is there in future? In the study of biology, three of the chief factors defining if something is alive are growth, movement and the survival instinct. At Horinkhola Polder 22, we happily witnessed a growing movement whose very existence will determine whether this community survives or not. Though the resistance is strong at Polder 22, the shrimp aquaculture industry is also determined to inundate this last vestige of traditional farmland. The question remains: how long can they resist, and how long will we remember their struggle burning like a fire among many fires?

Quote from Khushi Kabir of Nijera Kori in Bangladesh, May 2001: "In Horinkhola Polder 22, the shrimp thugs under the instigation of the local MP beat up three of my colleagues. There are armed thugs in the area and we are under severe pressure and threat. The local people, including farmers, even though they support us, are terrified to come out in open support. Luckily the landless groups and our staff are courageously remaining in the polder and ensuring the polder does not become a shrimp field...". (WRM Bulletin Nº 51, October 2001).

Bangladesh: Memorial Day of Korunamoyee Sardar

Every November 7th, the Korunamoyee Memorial Day takes place in Harinkhola. I asked some people to tell me what happened that day, ten years ago:

"On that 7th of November in 1990, a rich man, called Wazed Ali Biswash with some guards landed by boat in Horinkhola in Polder 22. He had planned to clear land for shrimp cultivation. It was 10 o'clock in the morning when we heard the news. We organised ourselves and together we went to Horinkhola. When we reached Horinkhola the shrimp owners shot and hurled bombs at our procession. Korunamoyee was hit by a bullet in her head and died immediately. Another 46 of our people were seriously injured and were hospitalised in Khulna or Dhaka. The incident lasted for one hour before Wazed Ali Biswash and his men took all the boats and left. Before leaving, however, they had cut up Korunamoyee's body into pieces and thrown these into the river to clear all the evidence.

We found it hard to reach hospital because Biswash and his men took all the boats; but when we finally reached it, the musclemen had advised the doctors against helping us. After two months all of us were back in Polder 22, but some of us still have disabilities as a reminder of that day. Anuaria for example lost her eye.

The case has been taken up in Paikgacha Union Parishad, the district administration office in Khulna and at the government level in Dhaka, but without results. There are yet 45 unsolved cases and Wazed Ali Biswash is still free.

The 7th of November 1991, the shrimp farm owners came to disturb the Memorial Day, but since then they have honoured her in peace. A mosaic monument and a stone have been erected in Korunamoyee's honour in Horinkhola. The script of the stone is: "life is struggle, struggle is life."

The 7 of November this year I will participate to show my respect for the landless people in Bangladesh who suffer from the violence caused by the land conflicts and the shrimp farms. We at Nijera Kori would appreciate if all of you in your own way give this strong woman a thought on this memorial day, so that international support can be felt within Bangladesh."

The landless people have built a beautiful mosaic monument in Horinkhola in respectful memory of Korunamoyee. This is really a monument to all the countless victims for their continuing struggle against the greed and the violence which has too often been a tragic associate of the shrimp aquaculture industry. (By: Asa Wistrand, Nijera Kori, WRM Bulletin Nº 51, October 2001).

Burma: Upstream deforestation and shrimp farming are destroying the mangroves

The WRM have been denouncing the extensive destruction of forests in Burma through deforestation processes – among which commercial logging plays a major role – resulting in serious impacts on the environment and on the livelihoods of local people.

One of those impacts is the sedimentation of rivers. Deforestation occurring in highland forests throughout central Burma triggers off several environmental alterations such as landslides and soil erosion. Once the soil is deprived of the several protective, cohesive and integral functions provided by the forest, it is prone to run off and deposit in the bed of the rivers, causing sedimentation and consequent impacts downstream. One of them is the impact on mangroves.

The Irrawaddy River has a sedimentation rate which is the fifth highest in the world behind the Yellow, Ganges, Amazon, and Mississippi rivers. The silt deposition in the Irrawaddy River has consequences on the mangroves of the Irrawaddy Delta which are one of Burma's coastal mangroves – some of the most degraded or destroyed mangrove systems in the Indo-Pacific. Previous estimates announced that if the situation between 1977 and 1986 regarding sedimentation was maintained, all the mangrove forests would disappear in fifty years.

Additionally, mangroves are being increasingly converted into fish and prawn industrial farms, mainly oriented for export. In 1990, the State Peace and Development Council (SPDC) in office proceeded to

declare Burma "open to free enterprise." For the US Commercial Service, Burma provides "good opportunities" for shrimp farming. Shwe Ayeyar Co., Ltd. and Regal Integrated Marine Resources Ltd. signed a memorandum of understanding on a shrimp farming project at Kan Maw Island, in the Tanintharyi Division on May 2, 2001. It is reportedly the largest foreign investment project in the livestock-breeding sector. The development of industrial shrimp farming has been gaining momentum in Burma since 1998 and spread rapidly along the coastal zone. Government data of Fiscal Year 1999/2000 claimed over 130,000 acres of fishponds, a dramatic increase from a decade earlier.

To make matters worse, the industrialising process of shrimp production in Burma has also been allegedly connected to forced labour within an economy tightly controlled by the military. According to the Mon Information Service, the present ruling military regime has maintained a government prawn-raising project at Kyauk Minaw and Kanyawbyin villages in Lauglon township solely by means of forced labour and extortion from the local population and prawn businessmen. Local prawn businessmen have been required to contribute young prawns, according to the quotas set by the government, while several local villages have had to contribute labour for the construction of all necessary buildings and ponds.

At the other end of the chain, well-fed consumers are being served prawns imported from Burma – or offered to buy furniture made from teak unsustainably logged in Burmese forests – unaware that they are contributing to the widespread social and environmental destruction of the country's resources and of its peoples' livelihoods. The beauties of globalisation! (WRM Bulletin Nº 65, December 2002).

Cambodia: Can banning be the solution to mangrove conservation?

Forests of Cambodia are being menaced by Vietnamese loggers. However, this not the only problem that Cambodian forests are facing. Half of the mangroves of the province of Koh Kong have been cleared either for shrimp farming or for high quality charcoal production. Of the province's original 10,000 hectares of mangrove forest, only 5,000 remain nowadays. Five years ago, the Ministry of the Environment had warned that the clearing of the mangroves would irreparably damage fisheries and wildlife in the area. Initially, clearing the land for shrimp farming was the major problem, but with the collapse of that industry, now charcoal production has become the activity responsible for mangrove destruction.

The government of the province has declared a ban on the cutting of mangroves, supposedly to meet a balance between development and preservation. The move has been welcomed by Cambodian environmentalist NGOs, which consider that, even if the reasons for the ban can be considered cynical, it is an attempt to avoid mangroves to disappear completely. Civil society organizations also underscore that there is a need to find job alternatives for the people who have been surviving on charcoal production.

Some areas of the province are prepared to stop the harvest of mangroves for charcoal production for the moment. Nevertheless, local communities have denounced that in other areas the trade is protected by the military. There is also the problem of people earning their living on charcoal. For example, An Samnang, one of the workers in charcoal production, coming from Prey Veng province, said he started producing charcoal in Koh Kong when the crops failed in his home village. Such work, even if risky and requiring living in a malarial area, allowed him to make a living. If mangroves are to be saved, it will therefore be insufficient – and socially unfair – to use banning as the only tool. People, as well as mangroves, need solutions in order to survive. (WRM Bulletin Nº 21, March 1999).

Cambodia: Too late and too little to protect mangroves

During the decade of the 1990s the Cambodian government, supported by the World Bank, tried to promote large-scale industrial shrimp farming in the coastline of the country. In 1993, the Mangrove Action Project (MAP) helped to avoid that the Thai agri-business giant Charoen Pokphand opens up

Cambodia's mangrove coasts to a black tiger prawn culture project. Nevertheless, the idea was not abandoned, and new investors from Thailand subsequently financed intensive black tiger shrimp aquaculture operations in Cambodia, importing equipment, expertise and even feed to that purpose. Koh Kong province, which shares an extensive border with Thailand, was invaded by shrimp farming ponds and the industry promised a future of prosperity for the region.

But in 1994, shrimp fever had reached Cambodia. Once again, like in Thailand and Taiwan before, this disease became the biggest enemy of the intensive shrimp aquaculture industry. It was expected that further developments – which would mean further mangrove destruction – would be stopped. The government itself admitted that the mangrove area in Cambodia had decreased from more than 63,000 hectares in 1992 to less than 16,000 in 1995, and the Ministry of the Environment blamed industrial shrimp farming for its depredatory activities, placing a temporary ban on new licenses. However, shrimp farming licences were still being given by the Fisheries Department after 1995, and only recently, as the situation was getting worse, new permits were prohibited.

Nowadays industrial shrimp ponds – that were supposed to bring prosperity to Koh Kong province – have been abandoned where mangroves once flourished. Thai capitals have also left the country... probably to establish their industry somewhere else, where mangroves are still standing.

Fifty per cent of mangrove areas worldwide have already disappeared and shrimp farming is one of the main causes for this environmental disaster. How long do we have to wait until further developments of this industry are halted for good? (WRM Bulletin Nº 33, April 2000).

India: Violence against local fisherfolk

Chilika Lake is one of the largest inland brackish water bodies in Asia, of immense ecological importance for its unique and varied biodiversity. Though Chilika was declared by the Ramsar Convention to be a wetland of international importance, the shrimp aquaculture industry at that time threatened to establish itself there via the mafia-like activities of the powerful industrial group Tata House which planned several industrial shrimp farms on the shores of Lake Chilika. By means of a court injunction, Tata House was stopped, and its pond construction halted mid-course, what was considered an important victory. Nevertheless later smaller scale shrimp farms operated by less noteworthy investors were quietly and illegally constructed. Over the years, the operation of these smaller shrimp farms has caused many problems for the local residents and environmental degradation at Chilika. Nowadays the situation has reached a boiling point.

A terrible tragedy has taken place at Chilika Lake. According to a report by the NNF-National Fishworkers Forum (India) and the World Forum of Fish-harvesters and Fishworkers, four protestors – including one woman – have been killed and thirteen other people injured by rampaging police in Orissa State. The victims were part of a group of residents of fishing villages who oppose continued shrimp farming in the Chilika Lake region.

The Supreme Court of India issued a historical judgement against aquaculture in Chilika, establishing that there should be no shrimp farms within 1000 meters of the lake. The fishworker organisation then gave a 24 hour ultimatum to demolish all prawn infrastructures, which lapsed on May 29th. After the deadline they themselves destroyed about 11 illegal prawn farms. Then the police reacted violently and raided the village beating villagers mercilessly, throwing tear gas shells and shooting them. Banchhanidhi Behera died on the spot, and Digambar Behrera and Prema Behra on the way to hospital. Another victim died later at hospital.

The NFF and the World Forum of Fish Harvesters and Fishworkers condemned the incident, strongly protested against the police action, demanded the withdrawal of the Aquaculture Authority Bill and asked the guilty to be punished immediately. NFF also expressed deep anguish over the way the

authority is handling the situation, and its serious concern about the personal safety of the leaders and the people of the movement. The organization also demands compensation for the family of the deceased and for the injured, as well as proper medical care for the injured. A strike call was made for June 5th.

That day the railway and road connection with the Eastern coast of the country came into a standstill. Fishworkers blockaded the railroad in many stations, as a result of which trains were stranded in different stations. From the morning, fishworkers started sitting on the railway lines of Rambha, Khallikote, Bhusandapur and other stations. In Bhubaneswar station 600 women carrying their children stopped the Chennai-Howrah Koromandal Express. Eight trains were cancelled. Apart from the communication system, in the rest of the state the impact of the strike was also important. In the capital Bhubaneswar it was totally successful and shops were closed. Thousands of fishworkers from Chilika and adjacent areas have made a human wall in the city and vehicles were totally stopped. Attendance in offices was very poor. Police arrested 2000 people including fishworkers and workers of different political groups.

Indian environmental and social NGOs have called for an international response in protest to the Prime Minister of India, and to the State authorities in Orissa where the violence occurred. In a letter of protest addressed to the Prime Minister Vajpayee, and Orissa Chief Minister, they expressed "their condemnation and absolute repulsion over the lamentable events that have occurred in Orissa, India that resulted in the killing of four fisher people, and the wounding of 13 others, as a result of police actions taken against their protests over the construction of shrimp aquaculture facilities in Chilika Lake.

Chilika Lake has been occupied by the shrimp industry, with the support of the local politicians and bureaucrats, even though the Supreme Court of India has ruled in an historical decision that shrimp farms were to be prohibited within 1,000 meters of the lake.

In response to the illegal establishment of these shrimp farms, the fisherfolk of Chilika, supported by the National Forum of Fisherworkers, were exercising their right to protest against these actions, and denounce them to the authorities.

The Indian Government must initiate actions against the people responsible for the deaths of these citizens of Chilika, and to prosecute those who have installed or continue to operate shrimp farms, in violation of the order of the Supreme Court of India". (WRM Bulletin Nº 24, June 1999).

Indonesia: Opponents to shrimp farming industry under arrest

Industrial shrimp pools are increasingly occupying mangroves areas and agricultural lands in many Southern countries. Their expansion is being strongly resisted by local peasants who have to suffer repression together with the loss of their land and livelihood. Sometimes peasants are forced to become exploited workers at the service of the companies. One example is coming from Indonesia.

The Oxford Office of the WRM has addressed Indonesian authorities in relation to the arbitrary arrest of a group of small farmers who opposed industrial shrimp farming in their lands:

"The World Rainforest Movement is deeply concerned by the news that Mr Endang Suparmono, arrested on February 8, 1999, and other farmers arrested in late 1998, are still under detention despite ample evidence that the accused farmers were some of the many that were severely exploited by the shrimp-farming company, PT Wachyuni Mandira.

We are aware that PT Wahyuni Mandira's 170,000 hectares shrimp farm in the Ogan komering Ilir district has become the focus of violent conflict after a two year dispute between the company and

local farmers over land compensation, contracts and credit agreements. It has come to our knowledge that a team from the National Human Rights Commission, who visited the area in late 1998, confirmed the farmers' claims that the contracts were unfair. Amongst other matters, it was also discovered that the Environmental Impact Assessment for the project was not complete and that the company was therefore operating illegally.

Other reports confirm the farmers' claims that they were treated like slaves under complete control of the company. It has also been reported that the arrest of Mr Endang Suparmono has been carried out without proof of his involvement in violent acts against company's property and was arrested only because he was one of the farmers' leaders who fought for better terms of employment.

Considering the highly unjust nature of the detention of Mr. Endang and the other farmers arrested in conjunction with the company's dispute, we strongly urge you to make sure that the farmers are immediately released and that the company is taken to justice." (WRM Bulletin Nº 21, March 1999).

Indonesia: Mounting tensions over industrial shrimp farming

Shrimp farming has been practised in Indonesia for hundreds of years. Shrimps were traditionally cultivated in paddy fields or in ponds combined with fishes, without significantly altering the mangrove forest. Due to recent increase in market demand, the method has been changed into intensive and semi-intensive, with much less respect to local ecosystems and people.

The introduction of modern technology started in 1971, when the Indonesian government built the first hatchery in South Sulawesi. With the support of the FAO and UNEP, the government set up The Brackishwater Aquaculture Development Center (BPPP) in Jepara (Central Java) in 1974. By 1989, more than one hundred hatchery units had been established in the country.

In 1984 the Indonesian government initiated a national program, known as INTAM (Intensify Tambak - shrimp pond), to intensify shrimp farming and at the same time to expand shrimp ponds in new locations. Between 1983 and 1984, the Asian Development Bank and the World Bank financially assisted several major shrimp farming projects. By the end of the 1980s, the Nucleus Estate Smallholders Scheme (NESS) was introduced into shrimp farming and very large scale shrimp farms started to be planned and developed. The area covered by ponds increased from 174,600 hectares in 1977 to 231,460 in 1989 and 305,500 in 1998.

In recent years, single shrimp farms covering up to 170,000 hectares have been planned and the government said that 860,000 hectares of mangrove forests (about 25% of Indonesian mangrove forest) are available to be converted into shrimp ponds. According to the government program Protekan 2003 (Program to Increase Fishery Export), the Agricultural Department intends to achieve an export volume of approximately 677,800 tonnes by 2003 against 97,228 tonnes in 1989 and 117,847 tonnes in 1998. One reason for such expansion is that shrimp exports earned precious foreign currency to Indonesia during the financial meltdown of 1997-98, so the government wants now to exploit as much as possible the foreign currency potential of shrimp farming, while ignoring the severe impacts on the local environment and people that are associated with industrial shrimp farming.

While traditional ponds were mostly located in Java Island, most of the new ventures are being developed in the outer islands of Sumatra, Kalimantan, Sulawesi and Irian Jaya, often associated with controversial transmigration programmes. The main markets of Indonesian shrimp have been Japan, Hong Kong, Singapore, Malaysia and USA, but new markets might be emerging in Europe.

While traditional ponds were individually or communally owned, new ventures tend to concentrate ownership into the hands of few companies. Currently, the three biggest shrimp breeding companies that are operating through the NESS model are PT Central Pertiwi Bratasena (PT.CPB), PT Dipasena

Citra Darmaja (PT.DCD) and PT Wahyuni Mandira (PT.WM). PT.CPB, which is 31% owned by the shrimp multinational Charoen Pokphand from Thailand, owns an area of 10,500 hectares and has plans to expand by a further 15,000 hectares in the same location. PT.DCD and PT.WM are owned by Gajah Tunggal Group, located in South Sumatra and Lampung with an area of 16.500ha and 30,000ha (6,000ha are in operation) respectively. In 1996, PT.CPB exported 17,000 tonnes of shrimp with a value of US$114 million. Meanwhile, in the same year, PT.DCD produced 19,853 tonnes, of which 13,423 tonnes were exported. PT.WM started operating at the end of 1996 and has just started its maximum production stage. Each of these three big companies contribute 20-30% of Indonesian's shrimp export. It can be said that almost 70-80% of Indonesian shrimp export is in the hands of these three companies.

Foreign investment is present but not in directly running the farms, apart from Charoen Pokphand in Bratasena and a French company in Sulawesi. Most of foreign investment in the shrimp industry is into shrimp feed, medicine and technology. Charoen Pokphand, Cargill, Comfeed are the biggest supporting industries.

Since 1992, shrimp production has been affected by virus attacks as in many other countries. Many ponds have been abandoned in Java and South Sulawesi, and shrimp investors are looking for new places to exploit. As a respond to virus attack, the government decided to import the species *Penaeus Vannamei* from South America, a controversial decision given that not enough studies have been conducted on the potential impacts of introducing a new species in the country.

Concerning the main environmental impacts of shrimp farming, documentation collected by NGOs and academics point to uncontrolled shrimp farming as a major threat to mangrove forests (due to conversion into ponds) and even to productive paddy fields and fruit orchards (due to freshwater salinisation). Shrimp farming has also been causing coastal erosion, sedimentation, and water pollution, thereby affecting coral reefs, seagrass beds and the productivity of coastal waters. Rehabilitation of abandoned ponds due to soil acidification is too costly for local people and government units.

Regarding social impacts, shrimp farming has generated severe tensions and conflicts between local people and outside workers, within communities, and between local people and investors/companies. One of the main reasons for conflict has been land grabbing and stealing. Supported by government agencies and police, companies force the local people to give up their land with inappropriate compensation or even with no compensation at all.

One of the unique characteristics of shrimp farming in Indonesia is the application of the 'Inti-Plasma' or NESS (Nucleus Estate Smallholders Scheme). A company converts large tracts of land (often mangroves or other wetland ecosystems) into shrimp ponds and then sets up agreements with smallholders, who buy all the input for farming one or a few ponds from the company and then sell the harvest to the company. Theoretically, the smallholders are expected to pay back their debt to the company within 7-8 years and to become independent owners of the pond and a small home. In reality, all the conditions and prices are set by the company, the accounts are kept by the company and the smallholders get trapped into a vicious cycle of poverty and debt. Even the social lives of the smallholders become totally controlled by the company: they can leave the 'shrimp estate' only for a few days per year and only for certain reasons approved by the company, they are penalised if they are late to return. When a shrimp harvest fails all the burden falls on the smallholders, who sink into even deeper debt. Smallholders live in a state of total dependency of unfair and shady company practices and in condition of semi-slavery.

The application of the NESS model to large-scale shrimp farming has caused severe social conflict and human rights violations. A geographical concentration of shrimp farming conflict is in South Sumatra. Three of the largest shrimp farming operations are located in adjacent areas in Sumatera

(Wahyuni Mandira in South Sumatera, Dipasena and Bratasena in Lampung). All of them are facing strong protests by local people due to land rights issues and human rights violations.

Wahyuni Mandira Co. now possesses 30,500 hectares and is planning to expand to 170,000 hectares. Prior to its operations in 1997, part of the land belonged to the local people and the other was a conservation area. 2,200 farmers were forced to give up their land for very small compensation, as the Provincial Government claimed that the land was a government asset and the local people didn't have land rights. Only 10% of them were invited to become smallholder farmers and the others were asked to migrate. More than one thousand resisted and stayed on in neighbouring land and in mangrove areas.

Then, in November 1998, about 1,600 farmers (smallholders) protested against the conditions imposed by the company. Frustrated by lack of response by the company, the National Parliament in Jakarta, the Regional Government of South Sumatera, and the National Commission on Human Rights, the farmers started to demonstrate in front of the farm management office and the situation went out of control, degenerating into riot. Minutes after the riot started, the farm was surrounded by military, while the farmers were trapped inside the farm with no food for several days. At the end, more than 30 farmers were arrested, 16 of them sentenced to prison for periods from 6 months to 5 years. The court never considered that there was strong evidence that the riot was set up by the company.

In order to expand the farming operation to 170,000 hectares, during the year 2000 the company built water canals through local people's lands, creating further tensions and conflict. Some of the local people run traditional shrimp farming. The company moved in with the protection of the army and police.

Similar stories have been unfolding in Dipasena Farming, a nearby shrimp farm under the same holding company, where more than 1,700 farmers (smallholders) protested for the same reason and the same demand, and in Shrimp Banggai Sulawesi farm, a 100 hectare joint venture between an Indonesian and a French company. The local people have filed a case against the companies, but are still waiting for a response from the Lower Court. Other well-documented similar cases have taken place in Maluku, Papua, and other locations in Sumatera. Resistance from the communities is not only related to land rights, but also to environmental impacts. The community in Bengkulu, Sumatera, opposed the construction of a shrimp farm in their area because of environmental concerns.

More recently, on August 15, 2001, Central Pertiwi Bahari (CPB), also known as Bratasena Farming, in Lampung Provinces was recently charged by 147 local people for land rights conflict over 347 hectares of land. The local people claimed that their land had been occupied by the company in 1995 without any compensation. The local people complained about the case to the company, local government and National Parliament at that time, but there was no response. The company now insists that it will respond to the claim if asked to do so by the government.

The NESS system is also very biased against women. In large-scale shrimp farming only adult and educated men can hope to get a job. In case of death or inability to work of the smallholder males, women must leave the farming estate, leaving behind all the assets that they had been paying for by credit installment.

Impact on health and education can also be considered serious, particularly on children. During the El Niño of 1999, malaria spread in South Sumatera partly due to abandoned shrimp ponds, which became an optimal environment for larva of Anopheles mosquito. The lack of drinking water has caused a number of people in Wahyuni Mandira Farm, Sumatera, to suffer of pneumonia due to drinking rain water.

In conclusion, the change from traditional to industrial shrimp farming that is rapidly taking place in Indonesia might in the short term benefit the government and the large-scale shrimp investors due to foreign currency generation, but the environmental and social costs associated with the industry by far outstrip the benefits. Local communities are particularly marginalised and exploited in large-scale NESS farms and local social structures are threatened by growing tensions and conflicts. (By: P. Raja Siregar,WRM Bulletin Nº 51, October 2001).

Indonesia: The destruction of mangrove ecosystems

Mangroves are a primary coastal biologically diverse ecosystem in tropical and subtropical regions which has traditionally supported local livelihood providing food --since the mangrove area is spawning and nursery area for many marine species-- firewood, charcoal, and timber, among other products.

Mangroves also perform a flood reduction function, help to prevent erosion of the riverbanks, and serve to dampen storm surges and to a minor extent high winds, both of which are associated with many tropical and subtropical storms. While the mangrove coastal barrier may be battered and damaged in severe storms, unlike any human-made coastal protection barrier, it will grow back naturally, without cost. However, mangrove ecosystems are being purposedly destroyed for unsustainable industrial activities.

Indonesian wetlands, including mangrove forests, swamps, and peatlands, have significantly declined in total area from 42.5 million hectares in 1987 to 33.8 million hectares this year. The destruction of wetlands has caused a number of disasters in the country including annual flooding, drought, and loss of biodiversity.

Significant areas of mangrove swamps in Indonesia and other regions of Southeast Asia have been "developed" to create ponds for the commercial production of fish and shrimps. It is estimated that mangrove forest area has declined from 3.2 million hectares in 1986 to 2.4 million in 1996, due to their conversion into fish and shrimp ponds.

Results of a research reported by the International Institute for Aerospace Survey and Earth Science in the delta of the Mahakam River, East Kalimantan, show that during the period of 1982 to 1996 about 17,429 hectares of mangrove forest in the region disappeared and changed to other land uses, mainly shrimp ponds for industrial production.

Hajrul Junaid of the Indonesian NGO Network for Forest Conservation (SKEPHI) agreed that the country's wetlands were severely damaged, and that it needed an integrated policy from the central government. " The government must move quickly, however, because there are obvious threats to the wetlands," he said. (WRM Bulletin Nº 65, December 2002).

Malaysia: Each prawn produced represents a teardrop

The shrimp industry in Malaysia has developed rapidly since the early 1980s after the so-called successes experienced in neighbouring Thailand, Indonesia and Philippines. Malaysia, however, is not one of the major producers of cultured marine prawn in the world, as the area under marine prawn culture is about 5,100 hectares (2,627 hectares in 1995). Despite this, the government of Malaysia is very proud to claim that the country's average production (metric tonnes per hectare) is the third highest in the world, after Taiwan and Thailand. And plans for intensification and expansion have been drawn up.

Based on the Food Production Action Plan (Fisheries Sector) that was formulated by the Fisheries Department, forecasted production of marine prawn (White Prawn, Penaeus penicillatus and Tiger Prawn, Penaeus monodon) in the year 2010 will be 129,100 metric tonnes. This amounts to a jump in production by about 13 times from the 1998 level of 9,835 metric tonnes.

In the early 1990's, the government identified 110,000 hectares of mangrove forest suitable for tiger prawn rearing and allocated RM15.38million for aquaculture development in the Sixth Malaysia Plan. State governments and related agencies were quick to alienate very valuable mangrove and peat swamp forests for this ecologically destructive activity and had even acquired very productive paddy lands for this purpose. Little thought had been spared for the impact of such destruction would have on the environment and the communities who depend on mangroves for their livelihood.

The major environmental impacts resulting from shrimp farming have been mangrove loss, water pollution and fisheries decline in coastal waters.

Mangroves form only about 3% (some 650,000ha) of the total land area in Malaysia. Most of the ponds opened during the 1980's and early 1990's involved the clearcutting of mangroves. Local fisherfolk are severely concerned about the increased loss of mangroves as this has led to decrease in wild stocks and extinction of several commercial fish species in some places. The Penang Inshore Fishermen Welfare Association states that its survey revealed that 34 species of fish have become extinct and another 50 or more are becoming rare in the waters off Penang.

The destruction of coastal mangroves has also brought about coastal erosion. The coastal villages are susceptible to critical erosion, battered by strong waves and storms. Their life and property is at stake as the raging sea is slowly swallowing the coast. Some ponds have been abandoned due to the erosion, acid sulphate soil conditions and occasional mass mortality of prawns due to disease outbreaks. The culturists do not make any effort to rehabilitate the degraded mangroves and again the coastal communities are victims of such development.

Although prawn farming is still a small industry in Malaysia, the social impacts have already become evident. Among the most worrying are the loss of livelihood and income of small coastal fisherfolk due to mangrove loss and fish decline, negative changes in agricultural practices, and human rights violations.

The most controversial shrimp project in Malaysia is in Kerpan (Kedah). Samak Aquaculture was approved as a joint venture company in 1993, and 60% is owned by a Saudi firm named Saudi Ben Ladin, 10% by the Kedah State Government and 30% by a company set up to represent the interest of the landowners and farmers. Government support for commercial aquaculture has helped companies like Samak immensely. However, the most reprehensible aspect of the whole project is that land already owned by local farmers was expropriated by the State in order to serve corporate interests.

Initially the State government and Samak began to woo farmers and landowners in Kerpan to sell, lease their land or join in the venture. Some of the landowners agreed to join the project but most of the bigger landowners and farmers, totaling 800, refused. Thus, the State invoked the Land Acquisition Act to take over the 1,000 acres of paddy land. The Act allows the State to acquire any privately owned lands if it deems that the development projects started there will be economically beneficial to the country.

The State offered a compensation between RM18,000 and RM24,000 (Ringgit Malay 3.8 = US$1) per acre, but the landowners refused to accept the menial compensation. In January 1995, about 100 farmers gathered at the entrance of the project site to stop excavators from moving into the site. Farmers held vigil in makeshift tents. In the next few days, police battalions gathered at the project site. A week later, heavy machinery moved into the project site. Rice farmers watched helplessly as bulldozers and heavy machinery began to tear up their paddy during harvest season.

Farmers, both men and women couldn't bear to watch and lay down on the road to prevent vehicles from moving in. The police arrested 33 of the protestors, comprising of 10 women and 23 men. The women were released after three days whilst the men spent seven days in jail. One of those detained

lamented that "The tragic of the day is that we are the victims and we were arrested for defending our rights."

The village was still mired in land disputes after seven years, the ponds have been dug, but disease outbreaks, legal wrangles, management problems and conflict over land have meant that in the seven years of existence, the operation has lost millions of dollars and had yet to export any prawns. Meanwhile, the farmers of Kerpan have been living in economic uncertainty for the past seven years and with impending poverty and loss of their self-provisioning lands, they find it difficult to make ends meet. As a farmer in Kerpan states, "Each prawn produced here represents a teardrop that belongs to one of us. That's how much we have suffered." (By: Meenakshi Raman, WRM Bulletin Nº 51, October 2001).

Malaysia: Penang's mangroves and biodiversity conservation

The Penang Inshore Fishermen Welfare Association (PIFWA) has recently held a workshop on the importance of mangroves. Fisherfolk had there the opportunity to highlight what they already knew: that mangrove forest is an inherent part of their livelihood since it is closely related to fish catch. Without mangroves there will be no fish in the sea since they play a vital role as intermediaries between marine and terrestrial ecosystems.

This rich ecosystem is home to several aquatic species – all kinds of fish, snails, cockles, shrimps and crabs –, reptiles like snake and monitor lizards, migratory and local birds, insects and mammals such as monkeys, wild boars and otters. There, the tide allows the formation of mudflats where trees grow, with a complex system of roots that shoot out of the mud and become a haven for many aquatic species which find there shelter to breed and feed their offspring.

But mangroves serve other functions: their strong roots hold firmly the soil and protect inland from soil erosion, storm and flooding. Also mangrove wood can be used for construction, to build jetties, houses, fences and pole markers. It can be used for fuel and even the process of burning it to turn it into charcoal is beneficial: the smoke is channelled into a funnel where condensation turns it back into water. This water has many useful properties, one of them is medicinal for cough and skin disease. Even the bark of the tree has a certain quality that strengthens clothes and nets if put to boil in water, something that fisherfolk take profit of. With proper technology, the bark serves also as anti-rust and protective paint for boats and jetties.

As a source of food, mangrove fruits are edible and mangrove leaves are a good food for goats and sheep, while the honey from bees which have built their hives in a mangrove forest is said to be more potent because such bees tend to be bigger and wilder. Roots are appropriate to make handles, axes and knives.

However, all these qualities of such a complex and prodigal ecosystem are being destroyed. In the island of Penang, there remain only 900 hectares of mangroves, only half of them considered forest reserve. Destruction since 1966 amounts to 130 hectares of mangroves per year. Unfortunately, this process is happening worldwide, and is related to shrimp farming carried out by big corporations.

In Balik Pulau, Penang, what used to be an exuberant stretch of mangrove forest has been invaded with hundreds of hectares of shrimp ponds in Kuala Sungai Pinang and Pulau Betong. The same happens in Sungai Chenaam and Batu Kawan, in Seberang Perai Selatan. Inshore fisherfolk from Batun Kawan remember that not long ago they did not need to fish deep into the sea because they found in the mangrove forest the catch for the day and more. Now the place is covered with roads and buildings, and the Jejawi River is polluted since aquaculture requires a high use of chemical inputs. Fisherfolk reported that areas where mangrove forests have been felled, register a gradual decline in fish catch over the years.

When a mangrove is destroyed, gone is with it the whole living system which it contains and irretrievably lost are the long term and long reach benefits it yields. Business for profit (for just a few) irresponsibly plunders local peoples' resources and destroys biodiversity ... the same biodiversity that the Malaysian government has committed itself to protect. If international agreements are to make any sense, then the government should support the fisherfolk – eager to conserve biological diversity – against the shrimp farming industry – only eager to make profits. Will it? (WRM Bulletin Nº 56, March 2002).

Philippines: Shrimp farming and mangrove decline

In the 1980s, shrimp farming became an industry when commercial availability of new technology from Taiwan, along with attractive export prices, led to the Shrimp Fever that swept the country and the rest of Asia. Filipino farmers shifted from milkfish (Chanos chanos) to shrimp, as well as intensified their culture systems from traditional and extensive to higher stocking densities.

Rising domestic prices and consumptio1n of shrimp, moreover, encouraged many sugarcane planters in Negros Occidental to convert to the monoculture of black tiger prawn (*Penaeus monodon*), setting up expensive aquaculture facilities and boosting Philippine shrimp production in the process. An increase in foreign aid for aquaculture development, coupled with reforms in Philippines' investments policies initiated under the Aquino administration in the late 80s, provided further support to the nascent shrimp industry resulting in an impressive and steady rise in production until the mid-90s.

However, the widespread outbreak of luminous bacteria in the Western Visayas – largely the result of poor farming and environmental practices – led to a spectacular collapse in shrimp production, particularly in Negros Occidental. By 1996, it was estimated that only one of ten shrimp farms in this province – once the center of intensive shrimp culture in the country – was operating.

J. H. Primavera, in "Development and Conservation of Philippine Mangroves: Institutional Issues" (1998), discussed the "intertwined histories of Philippine mangroves and aquaculture ponds", singling out the decline of mangrove ecosystems and the loss in goods and services derived from same resources, as one of the major impacts of shrimp farming.

She likewise pointed out the correlation between fish production and shrimp and mangrove areas: over the years, as mangrove areas declined, so did production from fish caught nearshore; in contrast, brackishwater pond area increased, as did the aquaculture sector's contribution to total Philippine fish production.

Moreover, "national policy encouraging brackishwater pond culture has been premised on the belief that mangroves and other wetlands are wastelands", Primavera added.

The Bureau of Fisheries and Aquaculture Resources (BFAR) – the lead agency tasked to ensure the protection and management of inland and marine resources – insists that its new thrust, the Aquaculture for Rural Development (ARD) program, departs sharply from the old paradigm that focused too much on technology and production.

However, despite its claims of being "mass-based with emphasis on simple environment-friendly technology" and geared towards solving "the perennial problem of poverty in the countryside", it appears that the ARD is still the same dog given a new collar: it aims to increase aquaculture production through such schemes as the establishment of mariculture parks, and "conversion of wastelands", such as "sand dune areas, lahar lands, sunken/flooded areas, mountainous areas, (and) marshlands/swamplands" into more "productive aquaculture areas".

With its history of favoring big business over small fisherfolk, combined with weak and vague national fisheries policies that obfuscate rather than enlighten, BFAR is inexorably paving the way for a repeat of the social and environmental mistakes of the Blue Revolution in the 70s, when some 200,000 hectares of mangroves were converted to fishponds – all in the name of so-called 'development' and 'progress'. (By: Gilbert Sepulveda, WRM Bulletin Nº 51, October 2001).

Sri Lanka: Local fisherfolk protect the mangroves

Mangroves are wetlands rich in biodiversity that are suffering a severe depredation worldwide. In Sri Lanka mangroves are associated with 22 brackish water bodies, locally known as lagoons. Even if mangroves area in that country is limited to 12,000 hectares, it is of much value since it includes very rare species and types of plant associations in different climatological zones. Fishing in these lagoons is the livelihood for over 120,000 coastal people.

Over the past decade many of the lagoons and estuaries in Sri Lanka have been subjected to rapid destruction of its mangrove vegetation for commercial aquaculture. This powerful industrial group is composed by big politicians, top level bureaucrats and businessmen, who have shown their lack of interest in mangrove conservation.

As a consequence of this unsustainable activity lagoons are silted, estuaries are eroded and mangrove ecosystems are deteriorated. In Puttlam District, for example, where the most extensive and rare mangrove species occur, more than 3,000 hectares of mangrove lands were converted to industrial shrimp farms under the government's patronage. Where the commercial shrimp farms are nowdays located, 28,000 lagoon fishers were engaged in fishing till 1994. After the construction of commercial shrimp farms two thirds of them lost their job and were obliged to migrate to the city in order to earn their living. Before the widespread of shrimp farming, the average fish catch per unit effort was 4 kg and by 1997, this had declined to 1.5 kg.

Commercial shrimp has also polluted groundwaters, what has directly affected drinking water, creating further problems for the fisher folk. At the village vicinity they do not have drinking water now and most of the women walk 5 to 6 km daily looking for fresh water. Due to lack of drinking water most of the children at the school age do not attend school; the reason is that in the morning they do not have water in the house and therefore their primary task is looking for water for their house consumption. All the lagoon periphery is blocked by the shrimp farmers who have constructed fences and maintain security personnel, what means that local fishers have even lost their right to access to the traditional source of their food.

Local communities of fishers have reacted organizing themselves to face this problem. The Small Fishers Federation was formed with the aim of mobilizing fishing communities and other associated people to conserve the lagoons and mangroves ecosystem, through appropriate education programmes and practical conservation strategies.

The primary task of the newly created group was to put the conflict on the table of negotiations. A participatory organizational mechanism was established, where more than 4,000 fishers actively participate in decision making on the conservation of mangroves, negotiate with shrimp farmers to monitor mangrove destruction activities and work for the improvement of fish habitats in the lagoons.

The following step was to create an organization that supports lagoon conservation and management committees where the fisher folk leaders from different lagoon fisher folk groups and government officials can dialogue to solve the conflict that affect their lives in such a hard way.

A so called Mangrove Conservation and Demonstration Centre was set up to carry out an education programme on mangroves and fish habitats. The Centre is visited daily by school children, university

students and other interested people; publications in three official languages used in Sri Lanka are issued, and seminars and workshops are conducted in order to promote mangrove protection as the most effective and equitative way to conserve nature and maintain local people livelihoods.

Regarding practical conservation strategies, more than 100 hectares of degraded land has been reconverted to mangrove forest. To face the loss of jobs resulting from the decline of fishing and the lack of access to the lagoons, the Small Fishers Federation is working to introduce alternative income generation activities focusing their efforts with fisher folk, women and youth. More than 623 jobs have been already created by promoting animal husbandry and other appropriate income generation sectors. (WRM Bulletin Nº 20, February 2001).

Thailand: Uncertain future for the world Nº 1 exporter?

Thailand has been the world's No. 1 producer and exporter of farmed shrimp for a number of years, with the shrimp boom starting in the early 1980's. The country's total shrimp output reached 300,000 tonnes last year, higher than the annual average of 200,000 to 250,000 tonnes, thanks to a supply shortage in the world market. Despite this, during 2001, shrimp farmer and exporter associations have asked the government to speedily implement a national policy encouraging shrimp farming to prepare for tougher export competition from neighbouring countries. India and Bangladesh together produce 60,000 to 80,000 tonnes; Indonesia 60,000 to 80,000 tonnes; Vietnam 50,000 to 70,000 tonnes; the Philippines 30,000 tonnes; and Malaysia 10,000 tonnes. According to shrimp exporters, due to government support and new policies, these countries now had greater potential to increase capacity and Thailand could be pushed out of the export market if a national policy to boost the sector was not developed.

The shrimp exporters are clearly vocal about the need to further support the shrimp industry, but they are mute concerning the tremendous environmental and social impacts of the industry. According to the Thai National Economic and Social Development Board, about 253,000ha of the country's 380,000ha of mangrove forests have been destroyed by shrimp farms. In several coastal provinces, many of these farms were located close to paddy fields, which have been impacted by saltwater contamination. The livelihood of farmers and fishermen communities close to shrimp farming areas have been very badly affected. Due to self-pollution, virus attacks and land degradation, many ponds along the coast have been abandoned and the industry has moved on to other areas, leaving behind large tracts of wasteland.

One of the targeted areas in recent years has been the inland rice bowl of the country in the central plains. This move generated heated opposition by rice farmers, NGOs and academics to the point that the government instituted a ban on inland farming of black tiger prawns two years ago. Due to the insatiable nature of the shrimp industry, the ban came under heavy attack during the year 2001 and there were strong rumours that the ban would soon be lifted. But due to pressure from civil society groups and academics, and advice from a sub-committee, the National Environment Board eventually decided to let the ban stand and urged promotion of environmentally-friendly and sustainable shrimp cultivation. Latest news report that inland prawn farmers in rice growing provinces would switch to a less profitable but more environmentally-friendly freshwater prawn known as koong kam kram (a freshwater prawn). Meanwhile, a policy prohibiting the cutting of mangroves and promoting the rehabilitation and reforestation of abandoned ponds has yet to be developed.

Local people have had a difficult time to voice opposition to the expansion of shrimp farming, as the police, the army and the justice system generally stand in support of those with money and political connections. In this state of affairs, the shrimp investors feel free to do what they like, sometimes going far beyond what is acceptable. In January 2001, Mr Jurin Rachapol, 49, a conservationist and advocate of community forestry in Phuket was assassinated while harvesting nuts on his farm. His family and friends believe that Jurin's activism against shrimp farming and

destructive fishing gear was the reason he was gunned down. Even the Bangkok Post published strong articles on this subject casting the conflict as one of conservation and wise use and management against, in the words of newspaper, "over-exploitation of natural resources" and "greed" of shrimp farmers.

The end of 2001, however, is not bringing good news to the shrimp industry. With forty-eight per cent of Thailand's shrimp exports going to the US, the industry will have to try new markets given the decline in US shrimp imports after the September 11 attacks. Latest news also report that Thai prawn farmers warned of contamination derived from improper cultivation that have resulted in products laced with anti-biotic substances that may be banned in European countries. (By: Maurizio Farhan Ferrari, WRM Bulletin Nº 51, October 2001).

Vietnam: Shrimps, mangroves and the World Bank (I)

Governments in Southeast Asia have promoted shrimp farming as a means to earning foreign exchange. The beneficiaries of this expansion are private companies such as the Thai agribusiness company, Charoen Pokphand. In Thailand, the World Bank, the Asian Development Bank, Charoen Pokphand and the Thai government worked together to set the scene for expanding the shrimp industry. Companies setting up shrimp farming operations in Thailand were offered generous subsidies including tax breaks, tariff-free imports, tax holidays and export credits.

During the 1990s, Charoen Pokphand expanded its operations to Vietnam. In 1993 Charoen Pokphand exported shrimp from Vietnam worth US$ 96 million – about 40 per cent of Vietnam's shrimp sales that year. Charoen Pokphand also operates shrimp-feed plants in Vietnam.

In the last 40 years, the area of mangrove forest in Vietnam has shrunk dramatically. For example, in the province of Ca Mau at the southernmost tip of Vietnam, an area of 60,000 hectares of mangrove forest was lost between 1983 and 1992. Causes include defoliation during the American war, logging, expansion of rice farming as a consequence of government agricultural policies, and influx of people, especially in Ca Mau province. In the last decade, government-promoted shrimp farming has increasingly become a major cause of mangrove loss. The role of mangrove forests in providing thatching for roofs, firewood, charcoal, medicinal plants and honey, as well as mangrove's role in protecting the coastline, has been lost in many places.

Shrimp farming tends to be a short term activity. Many farmers moving into shrimp farming without sufficient technical skill or money for the necessary infrastructure have found the land is useless after as little as three years. Shrimp farming is also at risk from disease. In 1994-95, a virus wiped out almost the entire shrimp harvest in Vietnam.

Although in Vietnam most shrimp farming is extensive, the Ministry of Planning and Investment has recommended intensifying production. Intensive shrimp farming uses antibiotics and chemical additives to increase production. Eventually the shrimp ponds and surrounding water systems are so poisoned that the land can only be abandoned.

Two years ago, a project funded by the World Bank and Dannida (the Danish government aid agency) started in mangrove areas of four provinces in the Mekong Delta. Titled the Coastal Wetlands Protection and Development project, the six-year project will involve a 470 kilometre-long stretch of coastline.

One of the studies produced for the project notes, "many occupants appear to be well aware of the need for reforestation as illustrated by individual and voluntary tree planting activities which can be observed at various locations." Yet, under the project, more than two thousand families are to be evicted so that mangrove trees can be planted. The people to be moved are not only shrimp farmers

but include farmers, forestry workers, salt producers, tailors, mechanics, handicraft producers, shopkeepers, fishers, and labourers.

Many of these people were encouraged to move to the area by local authorities, to grow shrimp or as forestry workers. The Bank's Resettlement Action Plan argues that the project will improve villagers' livelihoods through "community development support, including social infrastructure and services (health, household water supply and primary education)."

Rather than examining the role of government policy in promoting shrimp farming, Ronald Zweig, the World Bank task manager for the project, puts the blame for mangrove loss on villagers. Zweig says, "The rural poor in the project area have had few income-generating opportunities other than exploiting coastal forest resources to the point where the benefits from them have seriously eroded."

Of course, the US$ 31.8 million World Bank loan for the project will have to be repaid. To do this the Vietnamese government will require foreign exchange. To raise this the government will promote the export of cash crops – such as shrimp. In February 2001, Vietnam's aquaculture industry announced a five-year plan, a key aim of which is to increase the area of shrimp farming in the country from 226,000 hectares to 330,000 hectares. Deputy Minister for Fisheries, Nguyen Viet Thang, promised governmental financial assistance for shrimp farms of over 100 hectares.

The loss of Vietnam's mangrove forests is a complex issue. To blame the farmers who are clearing mangroves whilst ignoring government policy and an expanding aquaculture industry is to blame the victims. In the context of ever increasing shrimp exports, simply moving villagers and planting mangrove trees is unlikely to solve the problem. (By: Chris Lang, WRM Bulletin Nº 51, October 2001).

Vietnam: Shrimps, Mangroves and the World Bank (II)

Christopher Gibbs of the World Bank office in Hanoi, requested that WRM publish his response to article on Vietnam in WRM Bulletin 51. Mr Gibbs' letter is reproduced in full below, followed by Chris Lang's reply.

“November 16, 2001.

Dear WRM,

In WRM Bulletin #51, you published an article Vietnam: Shrimps, Mangroves and the World Bank by Chris Lang. This article was written and published without consulting the World Bank and, disappointingly, is inaccurate and makes a number of wrong assertions. In the interests of accuracy and your readers I would request that you publish on your website this response.

1. The World Bank's position on aquaculture in Vietnam

The World Bank's position throughout its dialog with the Government of Vietnam on aquaculture has been and continues to be consistent and clear, and is summarized in its 1998 rural development strategy report for Vietnam: Advancing Rural Development, which states:

"Without more careful site assessment and better practices, investments in aquaculture will be excessively risky. Shrimp, crab, prawn and fish farming, although risky can be highly profitable, and Vietnam has a high potential for aquaculture if solutions can be found for persistent disease and pollution problems. Further promotion of aquaculture must be preceded by enhanced knowledge of land use zoning and aquaculture practices. Otherwise, mangrove forests, wetlands and estuarine areas will be put at further risk, and poor households practicing intensive aquaculture will continue to gamble on risky investments."

2. The Vietnam Coastal Wetlands Protection and Development Project (CWPDP)

CWPDP is specifically designed to counteract mangrove destruction along 470 km of coastline in southern Vietnam. However, in the project area, it is the very poorest people who live among the mangroves and make a living by cutting them for firewood and charcoal who pose the threat to mangroves, the stability of the shoreline and the breeding grounds of fish. At the edge of the sea, poverty is the primary cause of coastal mangrove degradation and the project is responding directly to the development needs of the poor and environmental damage they do. CWPDP responds by supporting both mangrove replanting and providing – inland, but close to the original settlements – new economic activities for the poor. That is why some resettlement is necessary.

3. Resettlement

Resettlement is always best avoided and difficult to do well. For these reasons, the World Bank has its safeguard policy on resettlement (Operational Policy 4.30) and why resettlement in CWPDP has been carefully planned and is well supported. The only people being resettled in CWPDP (some 2,150 people, not more than 2,000 families as mentioned in Chris Lang's article) are those from the government-defined full protection zone (FPZ), a narrow strip dedicated to mangroves at the very edge of the sea.

Those being resettled are the people who have depended on cutting mangroves for a livelihood. Others, in the FPZ who depend on fishing, or live in areas where land is accumulating or are farming sandy soils, may stay. The households being resettled are among Vietnam's very poorest people who subsist by exploiting mangroves, and that is why they are being helped to start a new life where there are alternative economic opportunities to cutting mangroves.

Resettlement is always tricky, but CWPDP offers substantial support to those being resettled – land-for-land compensation, housing, transport, subsistence, training, vocational training – plus substantial support to the receiving communities. More than US$15.9 million is allocated for resettlement of FPZ occupants, including $8.5 million in credit through the Vietnam Bank for Agriculture and Rural Development, US$1.63 million for improved facilities in the receiving communities and an additional $672,000 for ethnic minorities. This is a carefully planned and generously financed program that we expect to work well.

4. World Bank support for aquaculture in Vietnam

The World Bank does not support brackish-water shrimp aquaculture in Vietnam. However, the World Bank does support the extension of rice-fish and rice-freshwater shrimp farming in some areas of the Mekong Delta to help mitigate the impacts of flood control in seasonally flooded areas. But freshwater prawn farming is less susceptible to the diseases of brackish water shrimp farming and can help to control insect pests of rice and lower the use of pesticides which has reached hazardous levels in many rice growing areas.

Thank you.

Christopher Gibbs,
Rural Sector Coordinator,
The World Bank Office in Hanoi,
Vietnam”

Chris Lang's reply:

“Christopher Gibbs' response to my article, disappointingly, is inaccurate and makes a number of wrong assertions. Gibbs states: ‘This article was written and published without consulting the World Bank’. On 23 October 2001, I wrote to John Carstensen at the Danish Environmental Assistance Programme in Hanoi (which is also supporting the project), asking a series of questions about the Coastal Wetlands Protection and Development Project. I copied the e-mail to Ronald Zweig, the World Bank task manager for the project. Carstensen replied saying that the Bank should reply to my questions. I still haven't received a reply from Zweig.

In fact, I first contacted the World Bank in Hanoi about this project in June 1995 when I spoke to Choeng-Hoy Chung, who was then the World Bank representative in Vietnam. On 12 September 1995, I wrote to him with several questions about the project. Two months later I sent him and others at the Bank a copy of a report I'd written, ‘The World Bank in Vietnam’, which included a critique of the Bank's mangrove project. I never received a reply either to my letter or to the report.

According to Gibbs, the Bank's position on aquaculture is ‘consistent and clear’. Yet, the statement that Gibbs quotes simply recommends sorting out the disease and pollution associated with shrimp farming and learning a bit about land use zoning and aquaculture practices. Then, Vietnam's ‘high potential for aquaculture’ can be realised, ‘further promotion of aquaculture’ can continue and presumably Charoen Pokphand can get on with selling shrimps to Europe.

Gibbs' letter makes no mention of companies such as Charoen Pokphand, who are the ultimate beneficiaries of the destruction of mangroves for the expansion of industrial shrimp farming.

In a similar vein to Ronald Zweig's comment quoted in my article, Gibbs puts the blame for mangrove loss on poor villagers. He says, ’in the project area, it is the very poorest people who live among the mangroves and make a living by cutting them for firewood and charcoal who pose the threat to mangroves’. Here, Gibbs is contradicting his own organisation's studies of the project area. The Bank's Resettlement Action Plan states: ‘The degradation of the mangrove forests can not solely be attributed to the families living in the FPZ [full protection zone]. Greatest harm to the forests has been caused by defoliation, indiscriminate cutting of timber by Forest Enterprises, illegal cutting by itinerant gangs from outside the region and, more recently, deforestation to enable the GOV [government of Vietnam] promoted shrimp production.’

Gibbs and Zweig are not alone at the World Bank in blaming villagers for forest destruction. Before Choeng-Hoy Chung moved to Hanoi he was based at the World Bank in Bangkok. In an interview in 1994 with journalist Nantiya Tangwisutijit, he explained that a successful forest management programme required three things: ‘First you need the *daab*, the sword, second you need the *khanom*, what westerners call a carrot, and third you need the *long thot*, the stick.’

The figure of ‘more than two thousand families’ to be evicted comes from the World Bank's project information document and the Resettlement Action Plan available on the World Bank web-site. One of my questions in my 23 October e-mail to John Carstensen specifically asks how many people were to be resettled. The occupations of people to be resettled listed in my article came from the Resettlement Action Plan.

Gibbs points out that, ‘The World Bank does not support brackish-water shrimp aquaculture in Vietnam.’ My article does not say that the Bank directly supports shrimp farming in Vietnam. However, each time the World Bank lends money to Vietnam, the country's debt increases. The government has little choice other than to promote cash crops such as shrimps to earn the foreign exchange needed to repay its debts. The World Bank is part of the problem, not part of the solution.” (WRM Bulletin Nº 52, November 2001).

- LATIN AMERICA

Belize: Villagers defend their mangroves

Placencia Lagoon in southern Belize separates the Placencia Peninsula from the southern Belize mainland. Mangroves in the Lagoon are an essential component of the Placencia Peninsula estuary system, filtering inland water, protecting the coastline and serving as home to large numbers species of the tropical wildlife. However, a proposal in course to build a two-lane causeway and a bridge across the Lagoon to connect it with the village of Independence in the mainland practically ignores environmental issues and just considers that the works will not upset the water flow of the lagoon nor threaten mangrove life.

On the contrary, many Placencia Peninsula residents fear that the causeway would significantly and adversely affect the Lagoon and the coral reef nearby. The livelihood of Placencia residents highly depends on the continuing environment health of the area, both for the small commercial fishing industry that has supported the area for hundreds of years, as well as for ecotourism. Local residents think that the causeway will be approved without an adequate environmental assessment, and that, if approved, proper environmental standards will not be enforced during causeway design and construction. They have organized themselves and went to the media with an anti-causeway petition. They consider that a project to build a causeway almost two miles long, including a forty foot high bridge to let boats through, is not the kind of undertaking that can be considered useful for the community nor good for the environment. (WRM Bulletin Nº 23, May 1999).

Belize: Shrimp farming threatens Placencia Lagoon's mangroves

In 1999 local residents of Placencia Lagoon – a shallow water body fringed by mangroves and very rich in terrestrial and aquatic wildlife, located in southern Belize – organized themselves to resist a project to build a two-lane causeway and a bridge across the Lagoon. The works would have caused a severe environmental impact, damaging ecotourism, the main activity in the area, as well as small scale fishing. A new threat is now pending on this rich ecosystem: industrial shrimp farming.

The Placencia Lagoon is largely responsible for the area's pristine waters and abundance of fish in the proximity to the Mesoamerican Barrier Reef, which furnish the basis for most resident's livelihood, and is a major scenario for ecotourism. The area has lately attracted shrimp farmers and "developers." Currently five shrimp farms are located on the Lagoon. Two new shrimp farms have been proposed and are in the process of applying for operational permits. Additionally, two of the existing ones have plans to expand and are in the final phase of approval for their respective permits.

Taking into account the deleterious effects of shrimp farming in many other tropical countries and the specific conditions of Placencia Lagoon's environment – which because of its soil composition and geology is likely to have a low carrying capacity and high pollution susceptibility – it is expected that such expansion would lead to an environmental disaster. Already in 1997 a report prepared by UNDP for the Belize Coastal Zone Management Authority warned that the shrimp farming industry in the Placencia Lagoon area was rapidly approaching its limit for sustainable shrimp production.

Signs of what may occur in a near future have already been perceived. Local residents have witnessed a decline in the area's fish stock and fear that the new and expanded shrimp farm operations, plus increasing commercial and residential developments will continue to degrade the Lagoon environment and their livelihoods. However, the government appears to be more interested in the promotion of shrimp farming than in the protection of mangroves. Shrimp farmers enjoy a favourable tax policy as well as lack of regulations for pollution control and mitigation. To the official

view, currency generated by industrial shrimp exports is more important than mangrove conservation. (WRM Bulletin Nº 38, September 2000).

Colombia: Local communities affected by shrimp companies

From 1982 onwards, the shrimp industry has been settling in the Cispatá Bay, an ecosystem harbouring one of the most exuberant mangroves in the Colombian Caribbean. Presently there are four shrimp industries fully established in this site, covering an extension of approximately 700 hectares. The semi-intensive productive system these farms apply has a daily water recharge in its ponds, reaching an average of up to 15% of its volume, leading to a daily dumping into the estuary of large quantities of water saturated by organic waste.

After 14 long years of carrying out this practice uninterruptedly, in 1996 the Soledad marshes, one of the most important bodies of water associated to the estuary, started showing the first signs of unbalance: the appearance of filamentous blooms of algae and the subsequent death of fish and shell-fish. This phenomenon was to be expected if we consider that the estuary of Cispatá Bay, due to its hydrodynamic characteristics, has a low level of daily replenishment of its waters, particularly in the extreme south-west of the estuary. Evidently the shrimp industry located in the area was most affected, as its production dwindled, but the serious prejudice to local artisan fishers should not be forgotten.

The shrimp industry's response was quick to come. Far from generating a change of attitude regarding the considerable dumping of waste water into the estuary, it promoted and started to build, with the endorsement of the environmental authorities, an artificial channel that was to communicate the Soledad marsh directly to the Caribbean Sea, in order to increase its daily replenishment of water based on high and low tides. There is no doubt that the water quality conditions in this part of the estuary would improve, giving the shrimp industry peace of mind. However the greater inflow of salt water directly from the sea involves a disproportionate amount of salinity in the estuary and therefore the imminent penetration of a saline band (through the water table) towards neighbouring agricultural zones, sustaining almost 2,500 families that live in nine rural communities.

Such a blunder caused the local communities to complain about the situation to the local and regional authorities, without achieving any attention on their part. The power of the shrimp industries involved was such that the works not only had a permit from the environmental authority without any prior technical assessment but were also using public machinery. Once all the possible legal mechanisms had been exhausted, and in view of the imminence of the work, the communities resorted to force to stop the construction, achieving their purpose after various days of struggle, in which about 400 peasants took part. Faced by the public scandal caused by the peasant protests, the shrimp companies halted the project.

It is worthwhile stressing the misleading arguments used by the shrimp companies to convince the authorities and local leaders of the soundness of their project. They talked of "restoration of the drainage system" to improve the operation of the estuary as an ecosystem, and of the generation of hundreds of jobs that would benefit the poor local communities. None of this was true, given that the underlying interest of the project was to get rid of organic waste that was being dumped every day into the estuary.

On having to abandon the project for a channel to the sea, they were obliged to improve their internal systems for the management of organic waste, having to build an artificial wetland as a bio-filter. In spite of the considerable investments made and an aggressive advertising campaign leading to a national prize for ecology, the environmental situation of the Soledad marsh and the rest of the estuary grows worse every day.

Five years after the first attempt at increasing the flow and ebb of water in the estuary, the shrimp companies are insisting again with their project. What happened to the bio-filter that won the prize? The project is essentially the same "Restoration of the drainage system," with the same Good Samaritan purposes: generation of employment and improvement of ecosystem functions. The major difference now lies in the fact that the project managers are no longer the shrimp industry, but the environmental authority itself, in this case the Regional Autonomous Corporation of the Sinú and San Jorge Valleys (CVS) and the municipality of San Antero.

"We have about 800 million pesos (approximately 348,000 USdollars) to restore the drainage system in the estuary," explained a CVS official to the peasant and fisher communities, as part of the permanent invitation to participate in the project.

Should the project be implemented, its effects on the peasant agri-systems in the nine rural communities located in the municipalities of San Antero, San Bernardo del Viento and Lorica, will be devastating, as the regulation of the Sinú river channel by the URRA I hydroelectric plant has significantly decreased the flow of fresh water towards the estuary. Faced by this new regional scenario, the salinity of land used by the local communities for agricultural and animal husbandry activities will be hastened, inducing the displacement of thousands of families to the neighbouring urban zones.

Presently the interest of the shrimp industry is not only to increase the capacity for water flow and ebb in the estuary, but to expand towards agricultural zones that have become saline due to the effect of the URRÁ I hydroelectric project and the "drainage system restoration" promoted by the environmental authority.

For this reason, the peasant and fisher communities, members of ASPROCIG, who have ancestrally used the lands in the Sinú River delta, are calling all people, NGOs and grass-roots organisations throughout the world to join in their struggle and to state their rejection of the project to the Colombian authorities. (WRM Bulletin Nº 51, October 2001).

Colombia: Actions against expansion of industrial shrimp farming

The semi-intensive production system used in shrimp farms located in the Department of Cordoba, in the Atlantic region of Colombia, has caused great disruption in the surrounding environment. Among other things, this system implies the constant dumping of large volumes of water saturated with organic waste into the estuary of the lower basin of the Sinu river.

The shrimp industry established in this estuary in 1982 already covers some 700 hectares and has been an important promoter of the Urra 1 hydroelectric dam. This dam which is already in operation, involved the flooding of over 7,000 hectares of forests, with a direct impact on the means of living and very existence of the Embera Katio indigenous peoples and the fishing communities in the area.

The company managers have everything under control: the hydroelectric plant regulates freshwater inflow, whereby they manage to increase salt water inflow, causing the salinisation of the lands adjacent to the estuary in the Cispata bay. It is estimated that 7,200 hectares of agricultural land are affected by salinisation. The local communities which historically occupied these lands with traditional subsistence crops have abandoned them. And this is precisely what the companies want: to occupy the agricultural lands adjacent to the mangrove ecosystems in order to install their artificial ponds for industrial shrimp breeding.

Attempts at expanding the shrimp industry along the Colombian Caribbean Coast, are being promoted with the complacency and support of the State, through the Ministry of Foreign Trade. Recently an agreement was signed between State bodies and private companies for the establishment of a further

9,000 hectares of shrimp ponds in the Department of la Guajira, to the extreme north of the country and another similar agreement is being prepared for the establishment of 8,000 hectares in the estuaries of the lower basin of the Sinu river.

The Association of Producers for Community Development of the Cienaga Grande del Bajo Sinu (ASPROCIG) are very concerned over this situation and are considering the preparation of various actions to face it. Contacts have already been established with FUNDECOL in Ecuador, who know only too well the disasters caused by the shrimp industry in the coastal zones of the country.

Depredation is orchestrated. It is sufficient to see how the different systems for the exploitation of resources repeat themselves, with the same noxious social, environmental and economic repercussions. For this reason, orchestration of efforts among those who are affected is essential. Along these lines, ASPROCIG has lodged this complaint with the international community and is making an urgent call for solidarity in the struggle to oppose the commercial interests that are attempting to sweep away their present and their future. (WRM Bulletin Nº 59, June 2002).

Ecuador: Greenpeace action to protect remaining mangroves

In July 1998, Ecuador's Minister of Environment Flor María Valverde has promised Greenpeace that she will take steps to secure a permanent ban on mangrove clearcuts – the destruction of mangrove forests by shrimp farming interests has been illegal in Ecuador since 1994 under Decree #1907.94.b. – by the country's shrimp farming industry and investigate evidence of illegal mangrove destruction in a protected national reserve.

In a meeting with Greenpeace, Minister Valverde also agreed to confront the Ecuadorian Forestry Institute of Natural Areas and Wildlife (INEFAN) over evidence of 745 cases of mangrove destruction by shrimp farm operators that were lodged with it by local environmental organization Fundecol since 1989. Only four cases were investigated.

However, Greenpeace is calling on the incoming government of Ecuador to honour the agreements made prior to its recent coming into office by Minister Valverde.

"The international community is now waiting to see how the present and future governments of Ecuador will stop the many shrimp farming operators from destroying what's left of Ecuador's mangrove forests," said Greenpeace spokesperson Gina Sánchez.

Greenpeace and it's ship Rainbow Warrior were invited to Ecuador by Fundecol to highlight the widespread and illegal destruction of mangrove forests by the shrimp aquaculture industry.

The meeting with the minister followed an earlier protest by Greenpeace activists and Fundecol at an illegal shrimp farm recently built in one of the last remaining mangrove forests in the Muisne region near Esmereldas. In this area, 20,800 hectares of mangrove forests have been reduced to 650 hectares after clearcutting by the shrimp aquaculture industry in the last 10 years.

During the protest, the Greenpeace ship Rainbow Warrior was ordered to remain in port. Ecuadorian authorities released the Rainbow Warrior after the Judge who ruled against Greenpeace was dismissed by the President of the Supreme Court. Similarly, the court order issuing arrest warrants for Fundecol directors and Rainbow Warrior crew members is now invalid.
(WRM Bulletin Nº 14, August 1998).

Ecuador: Government tries to hand over mangroves to the private sector

Ecuador is currently facing an extremely serious social situation as a result of a number of unpopular economic measures adopted by the government –in line with IMF and World Bank recommendations– which have resulted in workers' strikes, peasant and indigenous peoples' demonstrations, road blockades, violence in many parts of the country, rumours of a possible military coup and generalized caos within the country.

Among those measures, there is one which has received strong opposition from the environmental community and from the affected communities and which would further affect the country's mangrove ecosystems, many of which have already been destroyed by commercial shrim farming.

By that time – July 1998 – the environmental NGO Fundecol had registered 745 cases of mangrove destruction by shrimp farm operators.

On March 2nd President Jamil Mahuad announced on a national broadcast that he had sent to the National Congress a draft bill for the so called Rationalization of Public Finances, that – among other measures to face the budget deficit – establishes that shrimp farmers that use public lands would have to pay a fee for this use. In prior days, various newspapers warned that this measure was paving the way for shrimp company operators to purchase 60,000 hectares of land – apparently beaches and bays – along the Pacific coast. The operation would mean an income of US$ 60 million dollars to the State budget. At the same time, the government added that the idea of opening new concession areas for shrimp farms would not be discouraged. Traditionally, concessions to shrimp entrepreneurs were in most cases (95% according to Fundecol) not granted in "beaches and bays" but in mangroves as well as in agricultural areas. This was possible because of the existence of false reports and generalized corruption rampant in public administration, which allowed the companies to declare – once the pools were already built – that there were no mangroves or agricultural lands in the area.

Even though the text of the draft bill did not explicitly mention the possibility of coastal areas being sold to the shrimp entrepreneurs, the project caused justified alarm among environmental organizations in Ecuador and worldwide, since it was not difficult to realize that this was its final goal. In this regard, Sandra Cogliotore, President of the Chamber of Aquaculture publicly stated: "We will be the owners of the lands." In previous days, the Chamber of Aquaculture had strongly lobbied for the presidential draft bill to be passed on to the parliament. The industry even discussed the contents of the norm with the Minister of Trade, the Undersecretary of Fisheries, and the Merchant Navy (DIGMER).

Civil society quickly reacted to oppose this project, requesting international support to protest against this measure, that would worsen the already fragile situation of mangroves in Ecuador and would legalize the flagrant unlawfulness and depredatory practices with which the shrimp industry has always operated. Paradoxically, the economic crisis itself in which the country was plunged as a result of the announced economic measures halted, at least for the time being, the project. "It appears to us to be adequate that US$ 1,000 is paid per hectare, but the time period and the form or mechanism of payment need to be discussed. At this moment, no one has US$ 1,000 to pay ..." The serious political events and social unrest happening later diverted politicians' attention away from this issue. Nevertheless, the risk still persists.

Some reflections can be made in relation to these facts. The attitude of the Ecuadorian government needs to be highlighted. It has not hesitated in literally auctioning the natural resources of the country – in this case mangroves – to show its willingness to comply with the dictates of the international financing institutions, which demand a "balanced fiscal budget". In its view, the country's economy is completely divorced from the sustainable use of natural resources. Regarding the shrimp industry itself, it must be said that, after having obtained high profits through the depredation of coastal resources, it now tries to portray itself as cooperating with "development", since shrimp is one of the

country's important export. The present situation is ideal for the industry, because it could result in it becoming the owner of a significant area of mangroves that would disappear to give place to shrimp farms. Coastal populations are not taken into account in decisions such as the one being put forward by the government. On the contrary, much of the shrimp industry's infrastructure has occupied and destroyed areas that are part of ancestral territories and until then occupied and managed sustainably by traditional communities that had found there food and shelter. Additionally, the intended boosting of shrimp farming – and consequent mangrove destruction – does not take into account that mangroves act as natural barriers against the rise of the Pacific Ocean's water. Floods occuring during 1997 and 1998 as a consequence of "El Niño" phenomenon, showed what is to be expected in coastal areas if mangroves continue to disappear due to the irresponsibility of the authorites and the greed of a few powerful and influential entrepreneurs.

Thanks to the opposition from environmental and community organisations, the article of the draft bill concerning the privatization of mangroves was voted down. The struggle was facilitated by the fact that shrimp farmers, who are facing problems with the white spot disease, found that the one-time price of $1,000 per hectare for a 25 year lease ($1,500 for illegal occupants) established in the draft bill was too hard to bear. It is interesting to note that a recent decree of the Environment Ministry, related to the establishment of penalties to illegal cutting of mangroves, establishes that for purposes of the fines, the mangrove is valued in approximately US$ 13,000 per hectare per year. This figure is considerably higher than the US$ 1,500 per hectare established by the polemic draft bill, which shows that the Ecuadorian government has two widely differing ways of valuing the mangroves. Why? (WRM Bulletin Nº 21, March-June 1999).

Ecuador: Mangrove replanting initiative

Ecuador's lush mangroves at the Pacific Ocean coast have been suffering for long the effects of commercial shrimp farming that, together with the government's shortsighted vision and irresponsible behaviour on the issue, is to be blamed for the destruction of this valuable ecosystem regarding biodiversity, local communities' livelihoods and coastal protection.

Ecuadorian and international environmental NGOs have repeatedly expressed their concern over such a destructive process. Now Mangrove Action Project (MAP) and the Ecuadorian NGO FUNDECOL are dealing with a project to restore the once magnificent mangrove forest of Muisne.

MAP is a worldwide network and pro-active coalition that is addressing the serious issues associated with global mangrove forest loss. This specific programme aims at drawing national attention to mangrove loss and local community needs, support local initiatives on mangrove sustainable use, draw media attention to the plight of the coastal zones, rehabilitate mangrove zones degraded by industrial shrimp farming, draw a spotlight on issues which will benefit by this kind of actions, and educate volunteers coming from all around the world, who will gain in both knowledge and experience.

The programme, which counts on a limited budget but is high in volunteer involvement, will start next September and will last around 10 to 12 days. Participants will be involved in important environmental restoration work, while meeting and working together with some local Ecuadorian community people who themselves are dedicated to restoring the mangrove forest. (WRM Bulletin Nº 36, July 2000).

Ecuador: Action to save mangroves in Guayas

Industrial shrimp farming is one of the direct causes of the deforestation of mangroves in the tropics. In Ecuador the level of destruction caused by the 1970s and mid 1980s shrimp production boom continues unabated, even though a law for the protection of mangroves was approved in 1995. Nowadays there are in Ecuador 207,000 hectares of ponds which have affected 70% of the country's mangrove area and practically all of its estuaries in the Pacific Ocean shore. Local economies have

been disrupted. The successive Ecuadorian governments have been supporting this destructive activity – trumpetted as the "Blue Revolution" – by granting it land concessions, building infrastructure to favour the transport of the products, offering subsidies, etc. The "Trolley" Law passed in August 2000 establishes that present beneficiaries of concessions in mangroves and beaches where shrimp ponds are built can become owners of the land. This meant the complete loss of sovereignty of the Ecuadorian state over such a valuable resource. In December 2000 the Constitutional Court declared 22 articles inconstitutional, among them Nr. 164, which granted the property of beaches and bays to the shrimp industry.

A new case of destruction has been recently denounced by the members of a local crab-catchers association. This time it is at the Parroquia Naranjal in the western Province of Guayas. At a place called "Granja del Mar" near the River San Pablo, mangroves are being cut down for the construction of shrimp ponds.

The above is happening in spite of the fact that in July 2000 the Crab-catchers Association "6 de Julio" was granted by the Ministry of Environment a concession for the use of 1,666 hectares of mangroves. To their surprise, their legally-obtained concession area was invaded by outside agents – presumably linked to the shrimp industry – who have already destroyed 70 hectares of mangroves with the aim of setting up industrial shrimp farming infrastructure. Local dwellers have requested the intervention of the environmental authorities and of the Forest Agency of Guayas, but the situation still remains unchanged, and destruction continues.

The Ecuadorian National Coordination for the Defense of Mangroves – a coalition of environmental NGOs and local communities involved in mangrove management created to unite efforts to that aim – are asking for international solidarity to defend this precious ecosystem, which is also the source of livelihoods for a local community. (WRM Bulletin Nº 43, February 2001).

Ecuador: Mangroves and shrimp farming companies

Over 30 years ago, the destruction of mangroves was started in order to build ponds in beaches and bays. According to data from the former INEFAN (Forest, Natural Areas and Wild Life Ecuadorian Institute) and the National Aquaculture Chamber, in January 2000 there were 207,000 hectares or 170,000 hectares respectively of shrimp ponds, of which 50,454 hectares were operating legally. The rest are illegal. In the province of Esmeraldas, where the best conserved and tallest mangroves in the world are to be found, over 90% of the ponds installed there are illegal. Official information from CLIRSEN (Centro de Levantamientos Integrados de Recursos Naturales por Sensores Remotos) shows that in 1984, there were 89,368 hectares of shrimp ponds, indicating that the expansion of shrimp breeding over 16 years increased by 117,631 hectares.

The shrimp companies not only benefit from the Ecuadorian's natural heritage, but also from the weakness of their official policy. In June 1985, the government declared the conservation of mangroves to be of public interest. In September that same year, the Under-Secretariat for Fisheries suspended the granting of licences to carry out fish-farming in mangrove regions. In November 1986, the Government declared 362,742 hectares of mangroves and saline pampas to be protected forests. But legal regulations have no weight as in the period between 1984 and 1999 more mangroves were lost and more shrimp ponds were established than at any other time.

During this period of mangrove depredation, thousands of families that traditionally had depended on this ecosystem have been affected by the loss of their culture and of the environment that made their social and economic reproduction possible. For over 30 years now there has been impunity and violation of the laws in force in the country.

Over the past two years, the shrimp industry has complained about the problems affecting this activity, blaming all its economic ills on the White Spot virus for the reduction in shrimp production. What is not said and what is not recognised is the irresponsible way of acting to favour the shrimp companies getting richer, and provoking the destruction of mangroves.

Today the shrimp companies are getting ready to make another assault on nature with the installation of shrimp ponds on the high lands, which would cause salinity of agricultural lands and fresh water. If this undertaking is permitted, in a very short while Ecuador will be facing environmental disasters, such as the loss of agricultural lands due to soil salinity, the contamination of surface and groundwater, changes in the physical, chemical and microbiological structure of the soil, loss of terrestrial and aquatic biodiversity, in the name of salvaging the shrimp sector.

The national press, farmers, higher educational centres, local authorities, peasants and citizens from various sectors have voiced their protest and rejection of this activity which goes against the environment and have claimed the farmers' legitimate right to maintain their activities without the competition and prejudice caused by the shrimp companies.

Attention should also be drawn to the social impact that would be generated by competition between fish-farmers and agricultural farmers, together with problems in the use of water for human consumption and agriculture. Privileging economic issues, aimed at satisfying the demand of developed countries, over the production of food for the consumption of the Ecuadorian people, is equal to an attack on national food sovereignty.

The United States is the greatest consumer in the world. Shrimp consumption rose from 0,2 pounds per person to over 3 pounds in 1999 and has been constantly increasing since 1996, when the annual average was 2,50 pounds.

Regarding impacts on health, Greenpeace Austria, together with Greenpeace Germany sent the mass media a publication denouncing the effects of antibiotics applied to shrimps and particularly that of Chloramphenicol that, independently from its concentration, may cause strong effects, even causing death.

In showing up the various elements involved in aquaculture, an abominable picture of this activity appears:

- Destruction of mangroves to build ponds in beaches and bays
- Shrimp industry ponds operating illegally
- Thirty years of impunity and of violation of the laws in force in the country
- Installation of shrimp ponds in high lands
- At attack on the food sovereignty of the peoples
- Impacts on consumer health

In this context, the Ecuadorian environmental organisation, Acción Ecológica is promoting the non-consumption of shrimps produced in captivity in tropical countries as a way of protecting actively and in solidarity, mangroves and the peoples that depend on them. (By: Alfonso Román, WRM Bulletin Nº 51, October 2001).

Guatemala: Shrimp-farm generates violence and death

Fisherfolk from the Pacific Ocean port of Champerico are currently fighting for their livelihoods against the shrimp farming firm Camarones S.A. (Camarsa) and its subsidiary Pesca S.A.

Although Camarsa has been operating in the area since 1959, it was only in 1995 – with the arrival of the new owner Domingo Moreira – that the conflicts arose, including the closure of access to the wetlands used by the local fisherfolk – with a fence –, thus preventing them access to their traditional fishing grounds.

The situation eventually led to a meeting with Comarsa representatives at the beginning of May this year, where the local people requested the firm to remove the fence. No agreement was reached and as a result, some five hundred fisherfolk immediately decided to break the fence at three different places. Three fishermen were arrested by the police and the rest took a company representative hostage offering to exchange him for the release of the three arrested.

After a long negotiation, the authorities agreed to release those arrested and the company representative was set free by the local people. But almost immediately the company's security guards and the police charged against the demonstrators and killed 14-year-old Moytin Castellanos. Four other fishermen were also wounded by firearms.

This is not the first time that local fisherfolk are wounded by firearms. Local Champerico firemen have reported that during the past four years they have treated at least five cases of fishermen wounded by the company's security guards. They also report of many cases of people injured by "mezquite", a thorny plant used by the company to prevent access to the wetlands and shrimp ponds.

According to statements made to the local press by the affected people, the company pays miserable salaries and has appropriated a space which it does not own. Additionally, it has closed the access to public wetlands, which they use to feed their families. The local NGO Trópico Verde has found evidence that the company is operating illegally, because of not having complied with the legal requirement of carrying out environmental impact studies. Additionally, the company has for years been clear-cutting mangrove areas, which is prohibited by the 1996 Forestry Law.

After the serious confrontation that resulted in the death of Moytin Castellanos, the Champerico Human Rights Attorney established a negotiating committee integrated by the Governor of the Province of Champerico, the commanding officer of the Air Force, the Human Rights Attorney, six representatives and a lawyer for the shrimp farming company and thirty two fisherfolk representatives as well as Trópico Verde.

The negotiating process within the above commission broke off on May 21, when the Camarsa delegates demanded that the fisherfolk should prove the damages caused to the wetlands by its activities. On the following day, hundreds of fish appeared dead in one of the wetlands used by Camarsa. The fisherfolk fear that the company may have poisoned the water with some chemical and they sent samples of water and fish to several laboratories.

Camarsa is currently spending large amounts of money in the press accusing the fisherfolk for breaking off the negotiations, while at the same time disseminating a video on the Champerico confrontations where the fisherfolk are portrayed as criminals.

The situation is now very tense in Champerico. New demonstrations are being organized by the fisherfolk and local people fear the police may again violently repress the demonstrators. (WRM Bulletin Nº 46, May 2001).

Guatemala: Security for shrimps, insecurity for the local population

The Champerico community has been denouncing – since the beginning of May –, contamination of wetlands, the logging of mangroves (activity prohibited by the Environmental Law), closing of access

to public wetlands, acts of repression against fishermen (about 70% of the local population's diet is fish) and death of fish caused by the operations of Camarones del Sur, S.A. (Camarsa).

The indifference of the Guatemalan authorities towards serious infringement of the law by Camarsa, has triggered off various demonstrations, resulting in the death of a young man, Moytin Castellanos, in addition to various other people being injured.

Since the establishment of the Commission for resolution of conflicts, comprising senior government officials, the community has been demanding that Camarsa immediately cease its operations due to the serious irregularities involved in its operation.

This Commission met with representatives of the community without reaching any concrete result. Progress has been almost non-existent and the shrimp company continues operating, in spite of the commitment taken on by the Commission to immediately investigate complaints made by the local inhabitants. The frustration of the people of Champerico, who demand concrete response to the impunity with which Camarsa is operating, has not been long in making itself felt.

The population recently held another demonstration outside the shrimp factory installations, preventing people from entering into the factory. The demonstration ended with serious confrontations, during which Fernando Chiyoc died and seven people received bullet wounds from the security guards and other Camarsa employees. So far, the US citizen, Mike Corser, an engineer at Camarsa has been arrested, together with nine of the company's security guards, accused of homicide and attempted homicide.

However, the population fears that this may be yet another case of impunity. The facts are very serious and so far, no convincing response has been given by any responsible authority.

As if this were not enough, Camarsa delegates have interrupted negotiations, demanding that the local population submit evidence of the impact caused by the company's activities. However, the local NGO, Trópico Verde, states that "according to Guatemalan environmental laws (Legislative Decree 68-86, Law for the Protection and Enhancement of the Environment and Forestry Law, Decree 70-89, Regulation, Government Agreement 961-90) shrimp farming activities have the obligation to study the impact they will cause, provide measures to mitigate this impact and implement them. In other words, Guatemalan laws presume that an activity of this nature may cause damage to the environment, and therefore Camarsa is not justified in requesting third parties to show evidence of the contamination it produces.

In spite of this, Trópico Verde, together with the artisan fishermen from Champerico have carried out research, showing that there is contamination of wetlands and a serious lack of compliance with the environmental laws of the country. A full report on the issue – "The impact of shrimp farming activities in Champerico, Retalhuleu, Guatemala" – is available in Spanish on our web page.

So far, the government has tried to pull a curtain of smoke over the problem instead of solving it. Company interests are at stake here, and pressure is evident. In the meanwhile, contamination by the shrimp company and violation of Guatemalan laws continue and the two thousand families affected in Champerico are going through hard times, caused by the impunity with which Camarsa acts. (WRM Bulletin Nº 48, July 2001).

Honduras: Action to protect mangrove forests and wetlands against shrimp farming

Honduras has the obligation both under international and national law to protect 75,000 hectares of wetlands in the Gulf of Fonseca. On May 1999, The Honduran Government, through the Natural

Resources and Environment Secretariat (SERNA), during the RAMSAR Convention on Wetlands, obtained the designation of the Coastal Wetlands of the Gulf of Fonseca as "RAMSAR Site 1000".

Despite this, Honduras is not fulfilling its obligation to protect the "RAMSAR 1000 Site". Thus, CODDEFFAGOLF (a grassroots organization in Honduras) and ISA Net are strongly urging the Honduran government to fulfill its obligations both under international and national laws. Exact hectares of the damage is difficult to calculate because the areas are guarded by goons with AK47.

Thus far, shrimp farming projects and the cutting of mangroves have been allowed inside the Ramsar Convention protected areas. This has resulted in the drying up of some of these otherwise protected wetlands of the Gulf of Fonseca. In "La Aguadera", Punta Ratón, where the project "Habitat and Species Management Area in San Lorenzo" is located, a shrimp farming project was completed occupying several hectares of beautiful mangroves. Trees have been felled in "El Gorrión" (The Sparrow), the location for the project "Las Iguanas y Punta de Condega Habitat and Species Management Area". In the "La Berberia Habitat and Species Management Area", several mangrove areas and swamps like "Los Comejenes" have been destroyed to construct shrimp ponds. The constant use of the highway along the lagoon of La Berberia along the Nicaraguan border has greatly damaged the coastal ecosystem.

On March 2000, men felling trees using tractors in the zone of "El Carey" threatened a CODDEFFAGOLF member and expelled two government officials from the Environment Attorney's Office who tried to stop them. The government officials returned five days later with a group of policemen, found men operating four tractors, succeeded in stopping them momentarily, but later found them again felling trees and now using six tractors. The loggers boasted that nobody could stop them because they were "well protected".

In view of such situation, CODDEFFAGOLF and ISA Net urged all those interested in the conservation of these wetlands to participate in a letter-writing campaign. (WRM Bulletin Nº 33, April 2000).

Honduras: Struggle against shrimp farming gaining ground

After nine months of denouncing the destruction of wetlands at "El Carey", Marcovia, Choluteca; after several months after members of CODDEFFAGOLF (a local environmental organization) and the Environment Attorney were driven out with threats from that site; after several months of requesting international solidarity for this case; two months after the visit of a RAMSAR representative, and a few days after announcing the mobilization of fishermen and farmers to Choluteca, near the coast of the Gulf of Fonseca, CODDEFFAGOLF launched a Peoples' Peaceful Demostration, which has already achieved the following results:

- On November 29, one of the owners of a shrimp farm at "El Carey" was arrested and she is now facing charges at a Choluteca court. At the same time, there are rumours that her husband took refuge in a hospital alleging to be seriously ill.

- Parliamentarian Victor Argeñal, who has fenced several mangrove areas for converting them into shrimp farms in Guapinol, Choluteca, expressed an interest to discuss the matter with CODDEFFAGOLF. The response was that he should discuss the issue with the commission for mangrove conservation established three years ago.

- The shrimp farm company "Granjas Marinas San Bernardo" through its Manager Mr. Hector Corrales, has called the executives of CODDEFFAGOLF trying to intimidate them and expressing that CODDEFFAGOLF's allegations are lies.

- There are also unofficial reports that the Undersecretary for the Environment has denied the Environmental License to "Granjas Marinas San Bernardo" and to "Hondufarms", while the Minister of Environment, Xiomara Gómez, has expressed to CODDEFFAGOLF her interest in discussing this issue with executives of those companies and with CODDEFFAGOLF.

- The staff of "Granjas Marinas" has contacted fishermen in order to convince them about the "pressing need" of supporting this powerful company – that has polluted the area with tons of organic wastes coming directly from the more than three thousand hectares of ponds that are currently in operation – while at the same time they are constantly intimidating those fisherfolk which operate in the mangroves bordering its concession.

Although shrimp farming is still a big problem, things appear to be improving, at least regarding the stricter control that society and to a lesser extent government are imposing on this industry, which has already destroyed large areas of mangrove forests in Honduras and throughout the tropics. (WRM Bulletin Nº 41, December 2000).

Honduras: World Bank involvement in mangrove destruction

Industrial shrimp farming is a main cause for the loss of mangroves in the tropics. Even though private companies are the direct agents of such destruction it is important to highlight that governments and multilateral development agencies play a very active role in paving the way for this to happen.

The expansion of the "San Bernardo Marine Farms" (SBMF) shrimp company in the Gulf of Fonseca in Honduras is provoking grave concern. In June 1999 the International Finance Corporation (IFC) – private sector branch of the World Bank – granted a US$ 6 million dollar loan to SBMF, where US investors hold majority shares. The justification for the loan was apparently to "reactivate the shrimp production and recover from the damages caused by Hurricane Mitch". Such arguments do not seem to be very solid. On the one hand, it makes little sense with regard to the prevention against natural catastrophes – such as hurricanes – to support an activity that implies the destruction of mangroves which, among other valuable functions, act as a natural barrier for the protection of the coastline. On the other hand, the infrastructures of the company had not been severely affected by this climatic phenomenon and thus the new funds are being used by the company to expand its operations, causing further negative environmental impacts on neighbouring wetlands and on the livelihoods of local fishing communities.

As a result of the struggle of local fisherfolk and supporting organizations to protect the local ecosystems and to stop shrimp farming development, the area was declared a RAMSAR site at the end of 1999. However, neither that nor the World Bank's own environmental guidelines were taken into account by the IFC. As a result, the IFC itself now shares responsibility for the social conflict and environmental destruction that are resulting from the investment. Recently members of the local community who implemented an action to cut the access roads to the SBMF shrimp farm were subject to a savage repression by the national police. Additionally, the Environmental Impact Assessment carried out to obtain the environmental license to expand shrimp farming operations is under severe questioning.

The World Bank Group – to which the IFC belongs – has a number of guidelines regarding environmental protection. In spite of that, the IFC appears to chose to ignore them when providing funds to this investment. Will the World Bank do something to make the IFC comply with its own rules? (WRM Bulletin Nº 45, April 2001).

Honduras: Shrimp farming destruction

The waters of the Pacific Ocean penetrate the territory of Honduras, Nicaragua and El Salvador through a 35 km entry, forming a water mass of 3,200 kms2 known as the Gulf of Fonseca, with a 261 km coastline.

Different types of wetlands are to be found along the coast, such as mangroves, periodically irrigated by the tides. A forest inventory made in 1987, showed that in the Honduran sector of the Gulf, there were 47,000 hectares of mangroves that year.

At the beginning of 1973, the shrimp industry was launched in the Gulf wetlands, within a system of semi-intensive cultivation, with a density of between 10 and 30 post-larvae per square metre, including fertilisation in laboratories and harvesting in ponds.

This "closed cycle" reproduction system did not last many years. It was substituted by the capture of wild shrimp post-larvae in the wetlands and marshes. In 1995, 3,000 people, mainly children were involved in collecting post-larvae for shrimp farms. However the supply was not enough to cover the increasing demand for post-larvae and nurseries were established to satisfy it.

It was thus that shrimp farming started, a private undertaking that had the financial support of the International Development Agency (USAID), the World Bank and the Government of Honduras. The shrimp boom had started.

Between 1973 and 1989, the industry grew very quickly. However, in 1989, only 5 million pounds of shrimps were exported, instead of the 9 million pounds expected, coinciding with the appearance of the "Seagull Syndrome" which struck down the shrimps. Between 1990 and 1995, industrial exploitation rose to 12,000 hectares, but exports descended – from 20 million pounds in 1993 to 15 million in 1995 – attributed to the "Taura virus." In 1998, expansion reached 16,000 hectares but exports continued at 15 million pounds.

In 1999, the "White Spot virus," coming from Asia appeared in the Gulf, causing havoc to shrimp production. Between 1999 and 2000, thousands of hectares of shrimp farms were abandoned, various shrimp packing plants closed down and unemployment was rampant. Nearly all the small fish farms closed down their operations and were on the verge of loosing their goods due to their debts with the banks. However the large shrimp companies saved their situation thanks to multimillion dollar loans from the World Bank and the Inter-American Development Bank, among others.

The diseases imported by aquaculture not only had an impact on industrial shrimp breeding, but have also severely affected biological diversity and marine fisheries. Additionally, the loss of habitats for native and migratory bird species has been significant and has also harmed other species of fauna.

The catches of shrimp post-larvae to satisfy the billionaire requirements of fattening-up farms together with other species of by-catch, killed following selection by means of chemical products that do not harm shrimps but kill the other species (9 by-catch for each shrimp post-larva caught) also has serious impacts. Industrial demand may well be above 4 billion post-larvae, therefore the number of other species killed could be over 36 billion!

Additionally, the waste from the packing plants is dumped directly into the marshes where the accelerated fermentation processes cause the death of stocks of numerous species. Other wastes are dumped directly on the borders of highways or in fields, causing air contamination.

In various sites, the installation of shrimp farms has implied the prohibition to enter mangroves, lagoons, estuaries and the Gulf. For the local populations, this implies a loss of access to their

traditional sources of food, firewood and income, obliging them to "illegally" enter such areas, evading controls established by the companies. The result has been that between October 1992 and May 1998, nine fishers were found shot dead in the mangroves and estuaries near the shrimp farms. Their death has been related to shrimp farm surveillance.

In spite of public demonstrations in protest, of numerous complaints to the respective authorities and to the national press, these murders have never even been investigated and have remained unpunished.

The question generated among the fishers is "we have been evicted from the mountains, we have been evicted from the valleys, and now, if we are evicted from the coasts and the sea, where will we go? (WRM Bulletin Nº 51, October 2001).

Mexico: Mangroves vs. Shrimp farming and golf courses

The municipality of San Blas, (Nayarit, Mexico) is witnessing with great concern how the overdevelopment that has taken place in nearby Puerto Vallarta has attracted the attention of big investing consortia and spurred the ambitions of politicians and senior government officials from this country, resulting in a hoarding of lands, federal zones and mangroves for the purpose of commercial development.

At this moment, various shrimp farming projects of several thousand hectares are already under way. In particular a project of the "Granjas Aquanova, S.A. de C.V." company, which has already had a devastating impact on the ecosystem of this region, contaminating the estuaries with the residual waters and deforesting vast areas of mangroves. They have another project, with support from State and Federal governments, that will destroy several thousand hectares more.

In the field of tourism there are also negotiations for two mega-projects that would use more than 3500 hectares of Federal Zones and mangroves for the construction of 6 golf courses, more than 10 luxury hotels, marinas, etc. All of this is to take place with the consent of the local authorities who are now using repression to silence demands from local organizations. They argue that these demands are politically motivated. In the last two years or so, local NGOs have done their best to delay in all possible ways, the progress of these projects.

Some thirty years ago there were thousands of sea turtles coming to lay eggs on these shores every year. Now they are gone forever! The same thing will happen with all the migrating birds if the mangroves are turned into shrimp farming ponds and golf courses.

In such context, the local NGO "Grupo Ecológico Manglar" from San Blas, Nayarit, Mexico, seek support from the NGO community:

"We are too well aware of the enormous demands made upon your time and help from all parts of the world. But having resorted with little success to denunciation and lawsuits at the government level, we feel that we have no alternative and realize that the vested interests and corruption we are faced with are of international proportions. We feel that we have no alternative left but to turn for help to international ecological groups committed to the defense of the planet's health and ask them to intervene on our behalf, given the importance of these wetlands in the food chain and the future of life on earth." (WRM Bulletin Nº 11, April 1998).

Mexico: Mangrove destruction by tourism and shrimp farming

The expansion of tourism has meant the increase of the possibility of enjoying leisure time for many people worldwide. Nevertheless, tourism usually brings negative social and environmental consequences with it and more so in the case of the fragile mangrove ecosystems.

The mangroves and beaches off the Caribbean Coast of Mexico, known as the Maya Riviera, are being destroyed by more and more infrastructure for tourism built at a quick pace. Some people consider that this may benefit – at least temporally – the local economy as this creates jobs and stimulates cash flow, but the long range results are devastating. In one weekend, working night and day, an entire building site can take over a healthy thriving mangrove. This aquatic forest ecosystem, vital to the life of the coast, reef, and food chain to so many mammals, is being sacrified for the benefit of investors in hotels, malls, golf courses, convention halls, and shopping centres that are being erected at the cost of one of the world's precious natural resources. Even if these developments were to be placed on the hard land, behind the mangrove wetlands, negative effects can be expected, due to the runoff downstream of chemical and pesticide effluents.

The NGO People of the Mayan Cancun Corridor, with the support of Mangrove Action Project, are leading a campaign to halt the project to build a big hotel that will affect the Quintana Roo's mangroves in the Caribbean Coast.

Mangroves at the Pacific coast are also menaced. The situation in San Blas Nayarit in the area of Marismas Nacionales (National Swamps) is continuing to be critical, partly as a consequence of the indifference shown by the authorities. The international agreements for the protection of this fragile area are not enforced. The Grupo Ecológico Manglar has denounced that in this case the direct responsible for destruction is the shrimp farming company Aquanova Farms. Only once – in October 1998 – the authorities gave a response to the many complaints expressed by the environmentalists, and it consisted of a justification of the firm's activities, since it stated that the official investigation found insufficient proof that violations occurred, and for that reason the case was closed. Additionally the case was submitted to the Commission of Environmental Cooperation Canada-USA-Mexico, that committed itself to study it. Meanwhile a large area of mangroves is being lost every day because of the drying of waterways and lagoons caused by the expansion of Aquanova's shrimp cultivation ponds. (WRM Bulletin Nº 22, April 1999).

Mexico: Growing opposition to industrial shrimp farming

Shrimp, considered as the country’s pink gold, became the focus of Mexico’s export-oriented fishing activity because of the importance and economic value of the crustacean in the international – particularly US – market. Five Mexican states along the Pacific coast (Sonora, Sinaloa, Nayarit, Oaxaca, and Chiapas) and two along the East coast (Tamaulipas and Campeche) have developed shrimp aquaculture.

Sinaloa is currently the state with the largest number of shrimp farms and the highest production levels of cultivated shrimp and where environmental problems associated with the industry’s development are most prominent. The rapid proliferation in the number of shrimp farms is affecting the coastal ecosystems and the rural communities that depend on the resources provided by these ecosystems.

Despite existing regulations, there is a consensus that the aquaculture industry is transforming the coastal ecosystems of Sinaloa in a way that is affecting the livelihood and quality of life for residents of the many rural coastal communities.

The coastal lagoons and estuaries that characterize Sinaloa contain a diversity of habitats including mangrove forests, salt-marshes, inter-tidal pools, swamps, freshwater inner lagoons, and brackish and

seawater systems. A key environmental concern is the impact of shrimp farm construction on ecosystems. This issue is most prominent in the southern region of the state, where a single lagoon system can contain many shrimp farms. During the rainy season, the region's lagoons are habitats and nurseries for postlarvae and a variety of fishery resources, which form the basis of the commercial fishing activity and are also exploited by the rural coastal communities as common property. When these lagoons dry up with the end of the rains, they have traditionally been mined for salt both by individuals gathering it for home consumption as well as by some cooperatives.

In order to guarantee a permanent water supply to the shrimp farms, canals have been built to connect the lagoons with estuaries or the ocean, leading to permanent flooding. The government has granted concessions, mostly to private investors, to build shrimp farms in these coastal lagoons. Moreover, the concessions have converted a highly diverse coastal ecosystem into a monocrop system. This has resulted in a greater marginalization and displacement of the social sector and in an increased distrust of the government agencies in charge of developing the aquaculture industry. By transforming common-property lagoons into a privately owned resource, the concessions have exacerbated Sinaloa's social conflicts.

The discharge from shrimp ponds is considered to be one of the more recent and serious direct sources of pollution in Sinaloa's coastal waters. Shrimp-farm wastewater contains large amounts of organic material, fertilizers, chemicals, and antibiotics, which cause eutrophication in the lagoons and estuarine systems. In Sinaloa, wastewater from shrimp aquaculture activities has been linked to the formation of phytoplankton blooms, eutrophication, and the development of red tides in coastal marine waters

An additional environmental concern is the impact of the industry on mangrove ecosystems. In Mexico, there are approximately 123 coastal lagoons, most bordered by mangrove swamps. Mexico is home to four mangrove species: red (*Rhizophora mangle*), white (*Laguncunaria racemosa*), black (*Avicennia germinans*), and buttonwood (*Conocarpus erecta*). Mexico's mangrove forests cover approximately 660,000 hectares. Sinaloa's mangrove forests serve as nesting and feeding grounds for a large number of resident and migratory birds and as nurseries for shrimp, which form the basis of the inshore fishing industry. The trees are also used by the rural population as firewood and lumber. Over time, mangrove ecosystems in Sinaloa have been transformed by mining, agriculture, and the cattle industry. Currently, the shrimp aquaculture industry is also contributing to the ecological transformation of these ecosystems. It has been estimated that by 1994, 10,000 hectares of mangrove forests were destroyed to build shrimp ponds. Untreated shrimp-pond effluents are also contributing to the damage.

The global concern over the negative impact of commercial shrimp farming on the environment and humans has fueled the emergence of various grassroots social movements to resist the expansion of the industry. Among the causes igniting this resistance are local people's concerns with increasing pollution, and the loss of common-pool resources. In Mexico, resistance to the industry's expansion is slowly starting to appear and for the most part, this opposition has been developed by several of the fishing cooperatives in southern Sinaloa and northern Nayarit. Activities of fishing cooperatives in these states have included confrontations with personnel of shrimp farms and negotiations with government agencies in order to limit the expansion of the industry.

Among the most important grassroots organizations to oppose large-scale shrimp aquaculture near fishing grounds is the Federation of Fishing Cooperatives of Southern Sinaloa (The "Guerreros del Sur", *Warriors of the South*), which comprises 21 fishing cooperatives with a total of 2,000 fishermen. In 1998, the Guerreros del Sur openly opposed the construction of a shrimp farm in their granted fishing area, claiming that seven cooperatives would no longer be able to fish in the area because the shrimp farm would invade their space. The Federation had previously prevented the construction of a shrimp farm in another nearby community. In that case, the majority of the members of this community supported the effort, and the shrimp farm was not constructed. Members of this Federation have also

actively opposed the collection of wild shrimp larvae in coastal areas near their fishing grounds. In some instances, they showed up with truncheons to confront marine biologists and other shrimp farms personnel to demand they stop harvesting shrimp larvae. A number of fishing cooperatives in northern Nayarit have also opposed the construction of a shrimp farm near their fishing areas. In this case the fishermen have accused a private company of destroying large tracts of mangroves with their shrimp-pond operations. The fishing cooperatives were joined by an environmental organization, Grupo Manglar.

As more people become aware of the potential effects of the shrimp aquaculture industry, the fishing cooperatives and community groups opposing the expansion of the industry will get more support. There is no doubt that industrial aquaculture farming has had important ecological and social impacts, which in the long run may lead to the further erosion of the coastal and marine ecology and the ability of rural households to make a living. (WRM Bulletin Nº 51, October 2001).

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