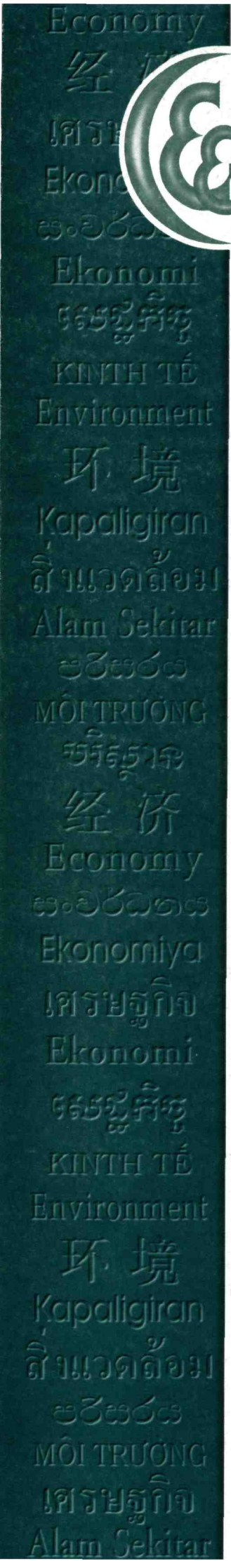

ECONOMY AND ENVIRONMENT PROGRAM FOR SOUTHEAST ASIA

POLICY BRIEF

CONVERSION OR CONFLICT? RESOLVING THE MANGROVE CONFLICT IN KOH KONG, CAMBODIA

A recent economic study of the mangroves of Koh Kong concludes that without an integrated management plan for the area, environmental degradation will continue, possibly leading to collapse of the resource.

This one-year study was undertaken by the Ministry of Environment with support from consultant Camille Bann and financing from EEPSEA. The study involved in-depth socio-economic surveys of households living within the mangrove areas, surveys of shrimp farms and extensive consultations with provincial officials. Data were analysed using a 'Total Economic Value' approach.

Mangroves are valuable ecosystems. They provide products such as fuelwood, food and construction materials and can be used as a site for human settlement. They also perform a number of critical ecological functions that support economic activities. Perhaps the best-known of these is support to local and commercial fisheries.

The mangroves of Koh Kong support a number of coastal households, are of high national and international ecological value, and represent a base for sustainable economic exploitation if carefully managed. In the past, activities in the area such as shrimp farming and charcoal production have been carried out in a way detrimental to the mangrove resource. Isolated policy initiatives introduced to address these issues have not been successful.

The study analyses two key uses of the mangrove resource: local community use and commercial shrimp farming.

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A survey of 90 households was undertaken in three villages within Koh Kapik, the study area and proposed Ramsar site, in order to provide information on the traditional uses of the mangrove by local communities. The research focused on the economic valuation of non-timber forest products collected from the mangrove area by households; these include fuelwood, charcoal, construction materials, and crabs, shrimp, fish and snails. In addition, the important ecological functions of the mangroves, such as storm protection and biodiversity maintenance were identified. Eight shrimp farms were surveyed in order to assess the viability of shrimp farming in the area.

The overall conclusion of this study is that given the complexity of the mangrove system and the linkages between its components, only an integrated management plan for the area can be successful in sustaining the mangrove resource.

The main findings of the study relate to local activities such as fishing and charcoal production, commercial shrimp farming and the issue of resettlement.

All of these findings have a common theme, that of 'linkages' either between various activities, or between various physical components. These linkages highlight the complexity of the mangrove system and the fact that a single intervention in one area is unlikely to be of any real success in isolation as it will have "knock on" effects elsewhere.

Over 90% of households are dependent on fishing for their livelihood. However, fish productivity has declined dramatically in recent years due to the increased number of fishers, the loss of mangrove areas to shrimp farms and water pollution from these farms. 90% of households involved in fishing claim that it was harder to fish now compared to 5 years ago. Local fishing benefits are estimated to be US$84 per hectare.

Households claim to have turned to charcoal production within the mangroves and logging in upland areas because returns from fishing are no longer sufficient for subsistence purposes. This suggests a linkage between, for example, shrimp farming, declines in fish yield and the adoption of new activities by local people resulting in new and additional stresses on the resource base.

While no charcoal kilns are believed to be currently active in the area, the Government intends to fully regenerate the mangrove forest and then to regulate and legalise the charcoal industry. However, what level of charcoal production would be sustainable for the area is as yet unclear, and requires careful consideration.

The area of mangrove forest required per charcoal kiln per year is estimated by this study to be between 0.20-0.40 hectares. Assuming a 30 year cutting cycle, and that only already disturbed mangrove areas would be allocated for charcoal production, potential returns per hectare per year for sustainably managed charcoal production are estimated at over US$400.

An important result of this study is that, even on a narrow financial analysis, shrimp farming in Koh Kong is unprofitable and unsustainable. Farms are typically abandoned after five years of operation.

While 50% of farms made a profit in the past year, overall shrimp farms in the area suffered an average loss of over US$1,000 per hectare. Largely due to problems with disease associated with poor water quality management, it is rare for farms to have two successful harvests a year, and in some cases both harvests have failed. Individual farms have reported losses ranging from US$ 40,000 - 240,000.

The real costs of shrimp farming are in fact much higher since the analysis does not account for the environmental costs associated with shrimp farming. Unsustainable shrimp farming is linked to water pollution and the extensive clearing of mangroves for farm use, preventing accretion and wiping out of nursery areas. There is also a social linkage: over 90% of local people oppose the shrimp farms. This could result in social unrest and security problems in the future if not adequately addressed.

The survey results show that 94% of the population have migrated to the area, attracted by the potential returns from fishing and charcoal production at a time when population and hence resource exploitation were low. The greatest influx into the area occurred during 1985-90.

The issue of the 'carrying capacity' of the mangrove resource base in Koh Kapik is linked to the possibility of relocation. The mangrove resource in Koh Kapik cannot, as currently managed, adequately support the current population in the area. Returns from fishing are low and no viable alternative livelihoods have been identified. Faced with low living standards, people appear to be making short-sighted production decisions which are not in the interest of long-term management. This is despite the fact that villagers recognise that activities which destroy the mangroves will affect their livelihood. Furthermore, there seem to be barriers to mobility that prevent people from migrating after their living standards fall. These include lack of money to move (the majority of people are in debt), insecurity in making the move, and lack of a place to go.

The relocation of families out of sensitive mangrove areas is supported by provincial authorities. Land is available in upland areas in the province where crop cultivation is possible alongside fishing. Some households in Koh Kapik have expressed an interest in relocation. While an in-depth assessment of the suitability of relocation sites is lacking, the possibility of voluntary relocation could be considered as a way of protecting an ecologically valuable resource and improving the living standards of the local people. Relocation support is estimated around US$2,000 per household to cover the cost of house construction and living expenses before the first harvest.

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Past policy initiatives have failed to protect the mangroves, because they were pursued in a 'single policy' framework. For example, while the charcoal kilns have been destroyed, no solutions for maintaining the living standards of local people are evident, and adequate management and control of shrimp farms is lacking. Complex systems require integrated policy intervention so that one policy intervention in one sector does not simply create a problem in another sector because of the linkage effects. Without such an initiative, the mangroves of Koh Kong remain seriously at risk.

The main recommendation of this study is that a comprehensive integrated land-use management strategy for the mangrove areas needs to be developed which safeguards the important ecological functions of the mangroves; allows sustainable traditional productive uses of the mangrove by local communities; and supports a sustainably managed commercial shrimp farming industry in designated areas.

A zoning system is proposed consisting of a core area representing areas of high ecological value such as Koh Kapik. This area could be afforded total protection, or permitted to be utilized for sustainable local use. The remaining area - the multiple use area - could be used for sustainable traditional uses, and shrimp farming and charcoal production in appropriately identified zones.

The management plan should be developed in close consultation with the local people. This has been very limited in the past. Local institutional strengthening should be emphasised throughout the development of the management plan.

Studies to determined sustainable levels of charcoal production for the area need to be initiated, and a system devised for managing and monitoring charcoal producers. At the same time the management of the shrimp farming industry requires a tough focus on sustainable practices, not short term profit, and greater involvement of the local community.

The issue of relocation should be carefully and thoroughly assessed. Voluntary relocation of people living within Koh Kapik to nearby upland areas within the province may be viable following an adequate period of consultation with local people and a proper assessment of the suitability of lands targeted for relocation (e.g., soil suitability and water availability studies).

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The full text of this study is available as an EEPSEA Research Report.