

- Project Update Pelagic Fisheries Development; December 15, 2001 -

**Pelagic Fisheries Development as an Alternative Livelihood
for Coastal Villages around Komodo National Park.**

*Hirmen Sofianto, Mirza Pedju, & Jos S. Pet
The Nature Conservancy, Coastal and Marine Program, Indonesia
Komodo Field Office, tel. +62-(0)385-41214, fax +62-(0)385-41225
Bali Office, phone +62(0)361-287272, fax +62-(0)361-270737*

Program Development

The pelagic fisheries development project in Komodo intends to convert destructive fishing practices and boats involved in demersal fisheries into sustainable pelagic fishing operations. Several Fish Aggregating Devices (FADs) were deployed to develop small-scale pelagic fisheries for species such as tuna (*Thunnus sp.*), skip jacks (*Katsuwonus sp.*) and eastern little tuna (*Euthynus sp.*). A FAD or "rumpon" consists of a bamboo raft, a (very long) mooring line, an anchor, and coconut fronds as the attractors attached to the mooring line. This construction increases the number of fishing locations, holds migrating true pelagics (mainly dolphin fish, yellow fin, skipjack and eastern little tuna) in the area and herewith increases overall catch rates. The main fishing methods used by locals around the existing FAD's is hand lining. The "FAD Program" is the second part of the pelagic fisheries development program, with the development of inshore pelagic fisheries targeting Spanish mackerel already successfully concluded by the year 2000.

The pelagic fisheries project has been working together with local communities, local government, fish traders, and expert fishermen from Manado, to enhance the establishment of the fisheries. Activities facilitated by TNC's Komodo Field Office have included feasibility studies, socialization, identification of models and systems, FAD deployment, training in fishing techniques, fish handling, post harvest techniques, cooperative development, coordination and development of strategic alliances, and marketing improvement. One of the most successful components of the FAD program was a technical training for fishers conducted in early 2001. The training was essential to create the momentum needed for successful development of the small-scale tuna fishery around the FADs. A total of 70 crews with their boats have joined the training program and participated in various project activities. A total of 159 fishers from the Sub-District of Komodo (which developed a group called "Harapan Keluarga") and 153 fishers from Sub-District Sape (group named "Banta Jaya") are currently engaged either part-time or full time in pelagic fisheries activities. These fishers together make up a fleet of some 100 boats of which 30 to 40 are currently full time engaged in pelagic fisheries at the FADs.

There were 6 deepwater FAD's deployed on the Flores side of the Park in 1999 and 2000. Several of these FAD's were lost, and had to be replaced in 2001, as a result of vandalizing by purse seine boats from Sulawesi. These purse seiners operate in waters remote from their origin and take advantage of the fish aggregating around the FADs. They take large quantities of fish at the expense of the local fishers who use simple hook

and line. Since mid 2001, a more professional management system, including continuous guarding of the FADs, has been implemented in the Komodo area, in close cooperation with local government agencies. This has led to the arrest of six illegally operating purse seiners, which were sent back to Sulawesi from where they originated. The FADs have not been vandalized by outsiders since the purse seine incident.

In 2001, the project deployed 2 FADs north of Seraya Island, in the area NE of the Park. These are managed and fished by the "Harapan Keluarga" fishing group from Labuan Bajo and Seraya. Two new FAD's have also been also deployed by the project on the Sumbawa side of the Park. These are managed and fished by the "Banta Jaya Sape" fishing group from Sape. One more FAD will be installed November 2001 for the area NE of the Park, based on the request of a local fishing village. Local fishers have also installed 2 FADs since early 2001.

Since early 2001, FAD fishing is successfully practiced by fishers from 7 or 8 local villages in and around the Park. The project is currently focusing on the business and management aspects of the fisheries. The project has started to attract private sector investments such as by PT Samudra Mina who has bought the product from these pelagic fishers and has expressed its interest to invest further in the installation of more FADs and in providing fishing gears and outboard engines for the fishers. A cool storage for fisheries products was also recently erected by private investors in Labuan Bajo. The design and construction of FADs depend on the price of material to be used, the costs of manpower to construct and to install it, as well as the funds available or allocated for it.

Investments, Catches and Revenues

Total costs for local development and management of a single FAD unit average about Rp 20.500.000 (or roughly US\$ 2,000.-). This total cost is made up of Rp 18,377,500 in construction costs and Rp 2,122,500 for maintenance costs. This amount is economically feasible when shared by a group of 10 fishing boats. About 1 FAD per group of 10 fishing boats is also what is practically used in the fisheries. The live span of a FAD is currently about 1 year on average when not vandalized. This means that group members need to set aside around Rp 200,000.- per month per fishing boat for FAD management (maintenance plus replacements). The project is currently focusing on establishing 'saving' procedures which will indeed set aside the necessary amount per boat per month.

For further economic calculations on the pelagic fisheries at the FADs, the catches and revenues were recorded for the fishing boats, which are organized in the fishing group "Harapan Keluarga". This group has 28 boats in its membership, 19 from Kampong Air in Labuan Bajo and 9 from Kampong Seraya on Seraya Island. The FADs which were installed north of Seraya Island are fished by an additional 25 local boats, which means that the production recorded by "Harapan Keluarga" represents around 50% of the total production on these FADs. Detailed data on the FADs in the Sape area are not yet available as the first FAD was installed there only on October 22, 2001

Between August and November 2001, the catches per boat per day have increased while fishermen became more skilled in the pelagic fishing techniques. In August 2001 the catch per boat per day averaged 75 kg. This average catch increased from 90 kg per boat per day in September, 102 kg per boat per day in October, and 119 kg per boat per day in November. The total catch by the "Harapan Keluarga" fishing group steadily rose from just over 500 kg per day in August to 650 kg per day in November 2001. Monthly production by fishing group "Harapan Keluarga" reached 20 tons in November 2001. Based on the estimation that "Harapan Keluarga" was responsible for about 50% of the production, the FADs off Seraya Island reached a production of 40 tons of fish (mostly tunas) per month in November 2001.

Fish prices for small tunas have increased during the development project from almost nothing in 1998 to Rp 2,500 at the end of the training period in August 2001. After that, when fish production started to increase, the prices increased monthly from Rp 2,800 per kg in September to Rp 3,000 in October and Rp 3,500 per kg most recently in November 2001. The above catches generated an average gross income of around Rp 190,000 per boat per day in August 2001, which steadily rose from Rp 250,000 in September, to around Rp 320,000 in October and to Rp 420,000 in November 2001. Average gross revenues per day for the "Harapan Keluarga" fishing group increased from Rp 1.3 M per day in August 2001 to Rp 1.5 M in September, Rp 1.9 M in October and Rp 2.3 M per day in November 2001.

The operational costs for fuel and logistics were about Rp 70,000 per fishing trip (one boat-day) in November 2001. Gross income per boat-day after above costs was therefore around Rp 350,000 in that month. Each boat fished an average of 8 days at the FADs each month, which yielded them around Rp 2.8 M gross (around US\$ 250.-) per boat per month in November 2001. From this gross income, Rp 200,000 would need to be set aside for FAD management (maintenance and replacement), and another Rp 200,000 for depreciation and maintenance costs for boat and engine. Depreciation costs for boat and engine were estimated at Rp 1.6 M per year and maintenance costs at Rp 800,000 per year. This leaves around Rp 2.4 M per month as the average "net income per boat", which can be compared with incomes from other fisheries.

At an average of less than 3 persons per boat crew in the "Harapan Keluarga" fishing group, this amounts to an average income of more than Rp 800,000 per crew-member per month (although sharing systems vary with different ownership systems). For comparison with destructive fishing practices such as blasting and cyanide fishing, estimates of income are used of about Rp 700,000 per month per local fisher. Income in the demersal fisheries is estimated at Rp 600,000 per month per fisher. The above figures were estimated using catch and revenue data from the "Harapan Keluarga" fishing group and during recent field interviews, and although these are very rough estimates they indicate the relative competitiveness of the new fisheries. Interestingly enough it seems that the number of fishing days per boat per month decreases with increasing daily income. Incentives to maximize total monthly income are still limited and the 'saving system' still needs major improvement. Local fishermen really prefer to take time (1 or more days) to 'celebrate' a good days catch.