

STREAM



Support to Regional Aquatic Resources Management

STREAM Journal

Learning and communicating about the livelihoods of fishers and farmers

The STREAM Initiative is supported by AusAID, DFID, FAO, NACA and VSO

Published by the STREAM Initiative, Network of Aquaculture Centres in Asia-Pacific (NACA), Suraswadi Building, Department of Fisheries Compound, Kasetsart University Campus, Ladyao, Jatujak, Bangkok, Thailand.

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Example citation for a *STREAM Journal* article:

Santos, R 2002 Learning from Each Other about Conflict. *STREAM Journal* 1(1), 1-2.

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Note

Browsing through this number of the *SJ* will remind readers of various types of water bodies – marine protected areas, reservoirs, leasable fisheries and backyard ponds – and it will recall different aquatic species inhabiting them: turtles, carps, tilapia, catfish and coral reef fish. Readers will once again be reminded of people whose lives and work are focused on aquatic resources: “Island Guardians” in Indonesia, village management groups in Lao PDR, a philanthropic leaseholder in Myanmar, *Jankars* in India, experienced traditional fish farmers in the Philippines, and community researchers in Vietnam.

We are pleased to publish the first three articles by colleagues working in the ‘newer’ STREAM countries of Indonesia, Lao PDR and Myanmar. Watch this space for articles from three other STREAM ‘new comers’ in the near future: Pakistan, Sri Lanka and Yunnan, China.

The authors of the other three articles include a previous *SJ* contributor in India, a colleague in our Philippines partner agency, and a friend from Vietnam whose organization’s work has been featured twice before in the *STREAM Journal*.

This *SJ* number is yet another reflection of the breadth of STREAM’s work around the Asia-Pacific region, and a testament to those who really make it happen – people working in our 11 STREAM countries.

Happy reading!

Graham Haylor, STREAM Director
William Savage, *STREAM Journal* Editor

Pasoso Project – Local Livelihoods and Turtle Conservation in a Small Island MPA in Central Sulawesi, Indonesia

Abigail Moore

From Ba Soso to Pasoso

Pulau Pasoso is a small island in the Makassar Straits off the west coast of Central Sulawesi, near the equator. Declared a provincial-level Marine Protected Area (MPA) in 1989, mainly for the nesting green turtle population, no effective implementation was put in place. Other protected species using the Pasoso MPA include hawksbill turtles, nesting birds, coconut crab, dolphins, dugong and Napoleon wrasse. Pasoso comes from the Bajo (sea gypsy) language. Asked where they were going, local Bajo usually replied “ba soso” (to suck), referring to the turtle eggs for which the island has long been famous. Pasoso is an important foul weather anchorage for small craft and a favored fishing location, with a history as a pirate base and many ghostly legends. Pak Achmad, who has long been called *Penjaga Pulau* (“Island Guardian”), is a local man with considerable local influence.

Livelihoods of the Pasoso Community

Due to harsh conditions, including a lack of fresh water, the island has been uninhabited for most of its past. It was settled about 50-60 years ago by a Filipino Bajo who married a local girl, and the islanders are their descendants. They guard the coconut plantation covering nearly half of the island, and belonging to a previous village head. Most Pasoso children still do or probably will attend the primary school on the mainland, staying with relatives, often for quite long periods. But they often take time out to spend on the island.

Much of the food comes from kitchen gardening, including staples such as cassava and banana and a variety of vegetables. The coconut groves provide oil, coconut milk, roofing materials,



Pasoso Project team and community

brooms and other products. Some trees also have edible leaves, and the cassava leaves, often cooked in coconut oil, are a source of vitamins and minerals, especially iron. They have a small flock of goats and some hens, but these are for special occasions such as births, deaths, weddings and circumcisions. The sea is the primary source of daily protein and cash income. Until recently the main supplement to the community's meager living standard was the sale of turtle eggs, thus defeating the main purpose of declaring Pasoso a protected area.

Pasoso Project and Community Involvement

A group of young people, assisted by the local NGO Yayasan Adi Citra Lestari¹, formed "Project Pasoso". They received a British Petroleum Conservation Award for data collection and conservation of the nesting green turtles, whose plight YACL witnessed during coral reef monitoring at Pasoso. Work was greatly assisted by other YACL programs². The group involved island residents from the outset, believing this to be the only way to sustainable conservation.

¹ YACL, see <http://www.yacl-sulawesi.org>

² With grants from The David & Lucille Packard Foundation and NOAA (National Aerospace and Oceanic Administration) of the USA, and UNEP EAS/RCU (United Nations Environment Program East Asian Seas Regional Coordinating Unit)

Without alternative opportunities, the community could not afford to give up the turtle egg income, a major source of cash for schooling, boat engine parts, household goods, clothing and other necessities. Lack of fresh water, usually brought from the mainland in Pak Achmad's ageing boat, was identified as a major livelihood problem.

Priorities were discussed to improve community livelihoods and the MPA's conservation status. Equipment to enable more sustainable fishing and a new boat engine were arranged. Simple facilities for improving visitors' stays on the island were set up with the community and more were planned. Some older children had sufficient literacy to learn and carry out turtle population survey procedures and became key data collectors and recorders. This provided a small but welcome boost to their income, a source of interest and pride.

Significant Change in the Pasoso Community

With a Swedish eco-tourism company, Las och Res ("travel and learn"), the team now organizes visits to enjoy the turtles around the fringe reef, dolphins playing in front of the nesting beach, coconut crabs, 'haunted' caves and other natural attractions. The small and irregular income makes a real difference to the community's living conditions and perception of themselves and their environment.

A Problem, Community Responsibility and a Lesson Learned

Part way through the project there was a major conservation set-back, which could also have led to a loss of trust toward outsiders, including the Pasoso Project team. Another NGO set up a turtle 'head-starting' program. Payment for providing fish to the captive hatchlings for around six months was promised. None was paid. As the community had promised to look after the little creatures, they did their 'best', feeding them on tridacna clams flourishing in the clear shallow waters. (The depletion in clam populations was shown in YACL monitoring.) With poor and overcrowded conditions, many hatchlings died, as survivors nibbled on their siblings.



Islanders with hatchlings

Told the clams were also protected, the community asked for guidance. Releasing the hatchlings was suggested. Pak Achmad, holding to the honesty required of his religion's true believers, wanted to keep his word, even if the NGO did not. A net suitable for the capture of food fish for the hatchlings and the community was eventually provided. From over 600 hatchlings less than 20 were eventually released. News just came of another 'head-starting' program underway, but details are not yet known. Let's hope it will be more responsible.

Community Involvement is the Most Effective and Cheapest Option

There is still much to do to make Pulau Pasoso a safe haven for nesting green turtles and other marine life, and to improve the livelihoods of the community who are becoming true "Island Guardians". Local authorities are now taking an interest in this small beautiful MPA and recognizing the value of involving the island community. If negotiations to make Pak Achmad officially a 'Guardian' of his beloved Pasoso are successful, the community will have a secure livelihood, doing what they do best – looking after their "corner of paradise" – for their own futures and for all those who visit this special place.

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Fisheries Development in Lao PDR

Khamphet Roger

Resources and Reservoirs

Information-gathering on inland fisheries and aquaculture development in Lao PDR was supported by the Mekong Committee from 1977 and by two FAO/UNDP projects from 1979. The main fisheries resources of the landlocked country are from the Mekong River and its main tributaries, lakes and reservoirs, ponds, rainfed rice paddy fields, irrigation, wetlands and swamps. These resources are not well managed and many are not yet utilized for fisheries because of inadequacies in funds, technical manpower, fisheries infrastructure, communications, and processing and preservation facilities, and limited domestic and export marketing avenues.

Among reservoirs in Lao PDR with fisheries resources are the Nam Ngum reservoir which occupies a water area of about 37,000 ha in Vientiane Province. Other smaller ones include Nam Houm and Nam Xouang in Vientiane Prefecture, Nam Selabam in Champassak Province, Nam Tane in Xayaboury Province, and Nam Dong in Luangprabang Province. Fish production in Nam Ngum reservoir in 1975 was about 50 kg/ha and was estimated to have declined to about 20 kg/ha in 1990. This was because of the impact of poor water quality and limited natural nutrients in the reservoir, among other factors.

Strategy for Fisheries Development

It is expected that new liberal policies of the national government – which include privatization of land ownership and trade – will benefit the development of the country's valuable fisheries resources. Lao PDR has received valuable assistance in this direction through FAO/UNDP, FAO/STREAM, the Interim Mekong Committee, JICA, the International Development Research Center (IDRC) of Canada, bilateral agencies and NGOs. Contributions from external sources have brought about a new awakening among people and the government and there is keen interest in the development and exploitation of fisheries resources. Benefits of the latest simple field technologies are expected to reach poor rural populations even in remote villages.

Fisheries development has been supported by a project on fish culture extension funded by UNDP and implemented by FAO. This worked with “progressive farmers” and demonstration fish farming systems at village level in ten of 17 provinces in the country. Other projects funded by IDRC included research studies of indigenous commercial species and their propagation, pond culture and conservation.

Other valuable contributions have come with the development of a commercial 50-hectare fish farm at Tha Ngone in Xaythany District of Vientiane Prefecture, and initial assistance to Nong Teng fish farm from the interim Mekong Committee. However, past and present international support was focused only on their specific areas of operation. The government still needs to identify gaps in its fisheries development strategy which need urgent support. One recent example is capacity-building in livelihoods approaches.

Fisheries Development Potential

According to Lao PDR government figures, fish is increasing in importance as a source of animal protein in people's diets. Fish accounted for 40% of animal protein in the national diet, or about 7-8 kg/person/year in rural areas from 1985-90, about 8-10 kg/person/year from 1991-99, and 10-14 kg/person/year from 2000-03. The Department of Livestock and Fisheries (DLF) reported in 2003 that fish accounted for more than 50% of animal protein consumption.

Aquatic food supply in Lao PDR is presently low, dominated by capture fisheries and complemented by enhanced fisheries and aquaculture. These latter two sources are thought to have potential to meet future deficits in fish production which may result from increased fish consumption and a decline in capture fisheries.

Two hundred and three indigenous species have been recorded in the Mekong River and its 14 tributaries, Nam Ngum reservoir, wetlands, swamps and rice paddy fields. The estimated fish production was 71,316 tons in 2000 from a total water area of about 944,781 hectares. The estimates from rice paddy fields include some enhanced production from stocking and also some forms of extensive culture practices.

Aquaculture

Current shortfalls in fish production caused by declining stocks of wild fish and a rapidly increasing human population are considered the major causes of the growing interest in aquaculture in Lao PDR since the early 1960s. Technical assistance in support of aquaculture was initially provided by the United States, later by the Mekong Committee and UNDP/FAO in the 1970s, and more recently by IDRC, CARE and the Asian Institute of Technology (AIT). Such technical assistance was geared towards establishing critical fish seed centers in a number of provinces and developing extension support services throughout the country. However, fish seed production was still low and fish seed distribution remains a serious constraint in aquaculture development. It has been reported that 27 species have been cultured – 17 indigenous and 10 exotic species – with carps predominating in both groups. The exotic species commonly cultured are two species of common carp, two Chinese carps (big head and silver), three species of Indian major carps (mrigal, rohu and catla), two species of tilapia and one species of African catfish.

Fish Farming and Other Systems

Fisheries development in Lao PDR is mainly aimed at attaining food security to improve people's daily protein intake. With the government's priority of food self-sufficiency, seven types of fish farming systems have been identified as being suitable for development: pond fish culture, integrated fish farming with husbandry (e.g., pig, chicken and duck), rice-cum-fish culture, fish seed production, net cage fish culture, net cage nursery, and village community fish pond culture. These fish farming systems are generally followed by farmers according to traditional, technical and/or mixed methods used in their respective highland and lowland areas.

Other aquaculture systems now gaining popularity include cage culture of tilapia and other indigenous species in reservoirs and along the bank of the Mekong River and its tributaries. Mobile hatcheries and small-scale nurseries are being run by fish farmers in highland areas. Community fish culture is also being carried out by village management groups in Vientiane and Champassak provinces.

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Creating Better Fisher Livelihoods through Leasable Fisheries

Khin Maung Soe

A Flood Plain, Leasable Fisheries and Outlaws

Taungtaman Inn was a flooded plain covered with water annually for the six rainy season months of May through October. During the other six months of the year, Taungtaman Inn became dry and the plain had no water at all. This flood plain was recognized as a leasable fishery with a usual lease period of only one year. Leaseholders normally had all rights to exploit fish in the lease areas and to capture fish with employed laborers. In such a situation, there were incidents of fish theft, and fierce quarrels among thieves and laborers. As a consequence, the livelihoods of laborers and villagers were uncertain, with a lot of gambling, theft, outlawed activities and crime. The most serious problem was that children had little or no chance to go to school. The Taungtaman Inn leasable fishery area was recognized as a place for outlaws.

A Leaseholder's Story

In 1994-95, U Myint Wai became a long-term leaseholder in Taungtaman Inn. By that time, a sluice gate had been constructed in the channel connecting the Ayawaddy River and the Taungtaman leasable fisheries area. Although the seasonal floodplain now remained as a lake for the whole year, it was reported that the catch had reduced to 33% of its normal average and some natural fish species were totally lost from the area. Given that situation, the leaseholder U Myint Wai decided to turn his leasable fishery into a natural fish pond.



First he bought fish fingerlings – mostly tilapia and carp (rohu, big head, silver carp and catla) – from the Department of Fisheries and seeded his leasable fishery. About 2.5 million fingerlings were released each year. In two years, the fish had grown to market size. Tilapia bred naturally and became the most numerous species. Fish breeding sites were demarcated and habitats restored. U Myint Wai also excavated nursery ponds on free land and practiced pre-nursing and seeding of larger fingerlings.

After two years, the area's fish population increased greatly and also spread to adjacent water bodies. The daily catch increased 3,500 viss³ (about 5.6 metric tons) to 5,000 viss (about eight metric tons) from the main water body of the leasable fisheries area. The selling price is variable – around 150-500 kyats⁴ per viss (about 90-300 kyats per kg) – depending on the kind of fish. The fish are not sold to private fish buying centers (common in Mandalay and the surrounding area for export and local markets), but are sold by individual fish vendors in surrounding villages. This is providing livelihoods for about 800 women fish vendors.

The leaseholder U Myint Wai has provided fishing implements, nets and boats to about 1,000 fishers living in surrounding villages. He allows independent fishing in his lease area. Each fisher can choose one of two alternatives for their daily catch from the lease area: accept one-third of his total catch value in cash or share the catch equally between fishers and leaseholders.

U Myint Wai set up four collection centers of his own on the perimeter. Fishers come to these places every day and sell out their catch. The collection centers then sell to the fish vendors who are generally family and relatives of the fishers. Through this kind of management, fishers and their families have been engaged in a better livelihood approach.

As for U Myint Wai, he has combated his poaching problem by sharing the profit and by providing welfare to his collaborators. His most outstanding contribution is taking responsibility each year for paying the expenses of students from 12 primary schools. He has personally provided charity and donations to monasteries, churches, mosques and temples in the villages surrounding his leasable fisheries area. Construction and repair of village roads and renovation of bridges are also included. During the period of his long-term lease, he constructed a nursery school in Taungtaman village and a Buddhist assembly hall in Taenantthar village.

Management and Participation

The way the Taungtaman Inn leasable fishery has been managed has provided livelihoods for villagers who are dependent on the fisheries resources. They have addressed such daily-life problems as food, clothing and shelter. They have also improved social services relating to children's education, social welfare and religion. As a consequence, the best of human nature has prevailed and the outlaws seem to have totally disappeared.



The management practice in the Taungtaman leasable fishery is a participatory means of exploiting fisheries resources and reflects what it means to share benefits for improving the livelihoods of people. Providing jobs for fishers and their families is also leading to poverty alleviation in the community. The leaseholder U Myint Wai carried out all of his efforts with a view to increasing fish production. He also sincerely tried to help fishers and their families to reach minimum requirements for household economic security through his way of organizing and managing with them. It seems that their livelihoods will be safe as long as their resources exist.

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³ A viss is a unit of weight in Myanmar, equivalent to about 1.6 kilos or 3.52 lbs; one viss has 100 tickles.

⁴ There are about 950 kyats per US\$; one kyat has 100 pyas.

The *Jankar* System for Sustainable Livelihoods: Lessons from the EIRFP

Binay Kumar Sahay

EIRFP

The Eastern India Rainfed Farming Project (EIRFP) is located in the eastern plateau region of India and covers parts of nine districts in the states of Jharkhand, Orissa and West Bengal. It was conceived in 1994-95 with the support of KRIBHCO⁵, the Government of India (GOI) and the Department for International Development (DfID) of the UK, and is now managed by the Gramin Vikas Trust (GVT)⁶. EIRFP is oriented toward improving the livelihoods of poor men and women using participatory approaches which are focused on poverty and gender issues.

EIRFP began in all three states as a “Participatory RNR⁷ Management Project”. It facilitates participatory planning processes toward the development of villages. In principle, local problems are identified and prioritized by villagers, who also identify development options for implementation with the facilitation of project staff. Program activities cover a range of farming system components, e.g., crops, agro-forestry, wasteland development, soil and water conservation, aquaculture, livestock development and irrigation. Enhancement of skills and capacities of men and women is an important project intervention. Communities are exposed and trained to develop an understanding of the importance of group formation and management and about different technologies for adoption.

Who are *Jankars* and How are They Selected?

EIRFP has evolved a *Jankar* system for empowering communities through skills- and capacity-building. A *Jankar* is a ‘para-professional’, a woman or man from the community who serves as an internal catalyst, an information source, service provider, trainer, disseminator and innovator. A *Jankar* is a facilitator who helps manage Self-Help Groups (SHG) and their activities, enhances community awareness about the suitability, adoption and monitoring of new technologies, and establishes links with government.

EIRFP Community Organizers are project staff who work with community members to facilitate village development plans. They also facilitate a process to identify and select motivated men and women to be *Jankars*. The project provides training programs and exposure visits that enable *Jankars* and community members to develop expertise and skills within villages and lessen dependency on outsiders.

Roles of *Jankars*

Jankars play important roles to bring change about in villages, especially with deprived women and men of tribal communities. Their roles are defined by group members and villagers, and typically include:

- Motivating the community to understand development needs
- Initiating a vision for community and livelihoods development
- Facilitating the community to participate in processes of planning, implementation, monitoring and evaluation
- Adopting suitable technologies for the community

⁵ Krishak Bharati Cooperative Limited, under the Ministry of Fertilizer, Government of India

⁶ GVT is an organization established and supported by KRIBHCO, GOI and DfID

⁷ Renewable Natural Resources

- Empowering the community and helping to define roles and responsibilities in the development process
- Linking with government, NGOs and others for institutional relationship-building, and
- Disseminating the project approach to surrounding areas to achieve wider goals.

Outcomes and Lessons from the *Jankar* System

An average of five *Jankars* have been trained in one SHG, with expertise in, for example, group formation and management, savings and credit, crops, aquaculture, soil and water conservation, and trees. Community members have been facilitated to undertake different farm and non-farm activities with the support of *Jankars*. After five years of working, some people have been identified as “dissemination *Jankars*” for surrounding villages. The project has initiated a process to link *Jankars* with government programs to get financial support for these self-motivated and trained *Jankars* to ensure the sustainability of the system. The project has developed around 1,500 men and women *Jankars* who are being absorbed by the government, NGOs and PRIs⁸ to provide technical support for development programs.

Some lessons learned from the *Jankar* system include:

- Motivation of communities becomes easier
- Technology can easily be transferred to communities for adoption
- There is more confidence among group members to make their own plans and implement them effectively
- Skills and capacity development among *Jankars* reduces dependency
- Activities and groups are sustained
- There is empowerment of women and deprived sections of the community through their active participation in decision-making
- Dissemination becomes more cost effective and sustainable, and
- There is more integrated RNR development and improvement of livelihoods.

The EIRFP *Jankar* system leads toward facilitation and realization of a plan for integrated development, scaling up of community capacity for the transfer and adoption of technologies, and empowering communities toward the sustainable improvement of livelihoods. Training and capacity-building measures not only empower *Jankars* but also enable them to work in favor of communities.



A Jankar with group members, harvesting the success

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⁸ Panchayat Raj Institution, a local-level people's governance body

Alternative Livelihoods for Landlocked Areas in BFAR Region 6

Jacqueline T Mamburam

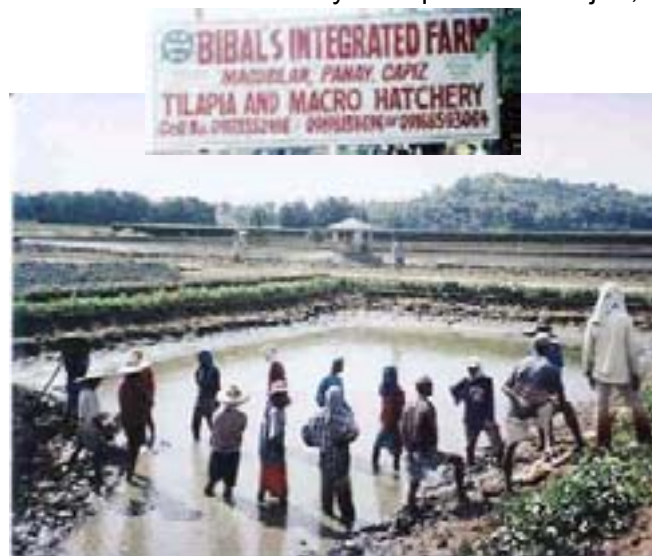
The 'Frontliner'

The Fisheries Extension Training and Communications Division (FETCD) of the Bureau of Fisheries and Aquatic Resources Regional Office 6 (BFAR 6) is the frontline division responsible for training and providing technical assistance and extension services in aquaculture, marine fisheries and post-harvest technology, in coordination with local government units (LGUs). I have been working with FETCD since February 2002, assigned as a Technical Staff with the Backyard Aquaculture Project, particularly on tilapia and catfish.

Freshwater Fisheries

The Backyard Aquaculture Project was conceptualized in response to feedback received from people in landlocked and upland areas that fisheries only exist in areas with *baybay* (sea) or in coastal areas. A 50-square-meter land area with a continuous source of fresh water was used for the project, the implementation of which has had a significant impact on inland aquaculture.

The farm of Mr Rodolfo Bibal in Magubilan, Panay, Capiz, used to be agricultural land with rice and vegetable crops as the main produce. With the dissemination of aquaculture technologies, he was able to receive and adopt inland freshwater technologies. Some of his idle areas were converted into grow-out ponds for freshwater tilapia. Mr Bibal said, "To make my venture on tilapia culture continuous, I need an immediate supply of fingerlings that would be available at any time my ponds are ready for stocking."



Men preparing ponds for stocking tilapia fingerlings. The dikes of the ponds are planted with vegetable crops.

In July 2003, BFAR launched its latest tilapia strain, GET EXCEL⁹, in Region 6. This was timely for Mr Bibal's plan of setting up a hatchery which is now producing about 50,000 fingerlings monthly and exceeds the requirements of his grow-out ponds. Mr Bibal is now not only a grower of tilapia but also a source of tilapia fingerlings in Panay and neighbouring municipalities.

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Constraint

In the trainings conducted by FETCD, a usual complaint received from participants is about the source of fingerlings for their next crop. In our training in Madalag, Aklan, Mr Patricio Roa, a participant, suggested, "What if the BFAR provides them with breeders instead?" I explained that breeders are only given to hatchery operators accredited by BFAR to safeguard quality since it is a genetically enhanced tilapia. On the other hand, catfish like the African Hito (*Clarias gariepinus*) do not breed naturally but have to undergo induced breeding to spawn. There is a separate training on induced breeding and hatchery operations provided for those interested to become technically equipped with the skills and technology.

⁹ Genetically Enhanced Tilapia EXcellent strain that has Comparable advantage with other tilapia strains for Entrepreneurial Livelihood

Since then, the office has been receiving requests for tilapia fingerlings that the Technology Outreach Station (TOS) in Santa Barbara, Iloilo, cannot accommodate instantly. According to the TOS Center Chief, they provide the fingerlings on a first-come first-serve basis. However, she understands that the 500 fingerlings provided by BFAR per beneficiary cannot compensate for the time, money and effort lost if they have to wait their turn when their ponds are ready for stocking.

Action to Address Constraint

To meet increasing demand for tilapia fingerlings, hatcheries were constructed throughout the region. This is a joint project of BFAR and LGUs. The Municipal Tilapia Hatcheries are in Miag-ao, Tubungan, Pavia, Santa Barbara, Bingawan and Balasan in Iloilo; Sagay City, Cadiz City, Bago City and Calatrava in Negros Occidental; and in Madalag, Aklan. Fisheries schools like the Aklan State University (ASU) in Banga, Aklan, and Iloilo State College of Fisheries (ISCOF), Tiwi, Barotac Nuevo, Iloilo, were provided with GET EXCEL breeders for propagation and educational purposes. In addition to these are accredited private hatcheries in several provinces. Fingerlings from these hatcheries can be bought for a minimal amount.



People in Talisay City, Negros Occidental, receive fingerlings from BFAR

Inclusion of Indigenous Practices

We have participants who are more experienced than us. They have their traditional ways of culturing tilapia and hito and have developed their own culture practices. One practice is feeding the fish with finely chopped *upas* (banana trunk) at least three days before harvest to clean the stomach and eliminate fishy odors. We always acknowledge these time-proven practices and we advise people to incorporate these with the culture protocols we are teaching to improve yield and quality of fish produced. The ideas we get from them are also shared with other beneficiaries for possible adoption.

Ulang and Carp for Freshwater Aquaculture

It is anticipated that tilapia and catfish will reach a saturation point in the market. Alternative species for freshwater aquaculture are gradually being introduced. Being considered for Region 6 are giant freshwater prawn (*Macrobrachium rosenbergii*), locally called *ulang*. The culture of *ulang* is promising because of the ideal hydrobiological and agroclimatic conditions in the area. I attended a National Trainer's Training on the Culture of Giant Freshwater Prawn in the Regional Freshwater Training Center, Fabrica, Bula, Camarines Sur. My co-participants from Region 4A (Cavite, Laguna, Batangas, Rizal, Quezon) said that the culture of freshwater prawn has already made a mark in their fishing industry. It is still in its infancy in Western Visayas (Region 6). Wild caught prawns are currently marketed but the supply is not enough to meet market demand. They command a high market price and are considered a delicacy in first-class hotels and restaurants.

During our Training on Induced Breeding and Polyculture of Freshwater Fishes, Dr Adelaida Palma – Center Chief of the National Inland Fisheries Technology Center (NIFTC), Tanay, Rizal – emphasized the need to position the carp industry in line with other high-valued fishes. It is considered an ideal option for freshwater aquaculture – and thus a potentially-viable livelihood – because they are less vulnerable to environmental and culture stress.

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Lessons Learned and Future Replication from Trao Reef Locally Managed Marine Reserve

Than Thi Hien

Facilitation, Involvement and Co-management

The Trao Reef Marine Reserve (a small-scale Marine Protected Area, or MPA) is located in Van Phong Bay at Xuan Tu Village, Van Hung Commune, of Van Ninh District in Khanh Hoa Province, Vietnam. Its marine biodiversity consists of coral reefs, sea grass and other associated ecosystems. The reserve was put into operation in 2001 with the facilitation of the International Marinelife Alliance (IMA) Vietnam and the involvement of the local community and local government of Van Hung, who are now co-managing the reserve. The Trao Reef model is recognized as one of the first locally-managed marine areas (LMMA) of Vietnam.

A Workshop

To evaluate and disseminate lessons learned from the Trao Reef experience for future replication, a two-day workshop was held in August 2004 in Nha Trang, also in Khanh Hoa Province. The workshop was co-organized by IMA Vietnam and the Van Ninh People's Committee with support from the SIDA Environmental Fund (SEF). The sixty participants represented local communities of Van Ninh commune, local government agencies, research institutions and interested local people from other MPAs in south-central Vietnam (in Ninh Thuan, Thua Thien Hue and Quang Nam provinces).



Participants sharing core economic and biological values of coral reefs

Progress, Experiences, a Suggestion and a Visit

Through presentations and discussion on the first day of the workshop, participants shared information about significant progress. Since the Trao Reef Marine Reserve model draws on local community experience in coastal resources management, participants learned about how they were involved in the establishment and development of the reserve. Also addressed were environmental and socio-economic impacts of the marine reserve on the local community and how to sustain the reserve after it was officially handed over by IMA to the local partners in early 2004. Strong commitment and support from the local government were gained as a result of the workshop. Participants from other MPAs actively contributed to the workshop by sharing their thinking and experiences of community-based small-scale fisheries co-management in Tam Giang Lagoon, and also on carrying out education and livelihoods activities in Ninh Thuan Province. An important suggestion was to develop a legal framework to facilitate MPAs (including Trao Reef) and their management at community and national levels.

A study tour to Trao Reef Marine Reserve with more than 30 participants took place on the second day of the workshop, hosted by the Trao Reef Management Board and the Core Group. Participants learned about environmentally-friendly aquaculture including green mussels,

oysters, seaweeds and lobsters. The visitors also had the opportunity to dive and view the coral reefs and fish species. During the last couple of years, Trao Reef has been visited by many groups to learn about marine resources protection, coral transplantation and the development of sustainable livelihoods. Consequently, the coral eco-system and reef resources have been rehabilitated to create a home for many fish species, and there may be potential for eco-tourism development.

A Community-based Eco-tourism Research Project

As a follow-up to the workshop, a community-based eco-tourism research project is being conducted by IMA and the local community with the support of LeaRN (Learning Research Network) of the CBCRM Resource Centre. The purpose is to facilitate grassroots learning and to promote people's research and decision-making capabilities in livelihoods development and resources management. Project activities include awareness-raising and capacity-building for the local community (e.g., skills training in areas such as participatory planning, product marketing and environmental and ecological explanations), demonstration of pilot tours and an evaluation workshop for sharing results and lessons learned from the project.

The development of eco-tourism at Trao Reef could be an alternative livelihood for the local community and could help foster marine conservation efforts and respect for cultural values. It has been found that people who earn money from eco-tourism are more likely to protect their natural resources and support conservation efforts. Eco-tourism projects help forge a direct link between economic benefits and protection of bio-diversity. Eco-tourism at Trao Reef could help develop other livelihoods activities through job creation in



A study tour to Trao Reef is an experiential learning opportunity for many groups

Xuan Tu Village, especially for women, who are important participants in and beneficiaries of the eco-tourism project. Examples of livelihoods could be aquaculture to provide local food (green mussels and oysters), fruit plantation (coconuts) and the provision of services. The project will also help enhance cultural values and the indigenous knowledge of local people.

The research project has been initiated because of local needs and will be geared toward increasing local community participation in integrating issues of development and the environment. It will help build capacity and partnerships among stakeholders such as NGOs, communities, government, the private sector and public agencies. It is expected that results from this project will be incorporated into a tourism development plan for Van Phong Bay, which is designated by the local government as one of the main tourism regions of the country.

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[Editor's Note: See previous articles about IMA Vietnam's work in SJ1(4) and SJ2(3).]

About the STREAM Journal

Published by STREAM – Support to Regional Aquatic Resources Management

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Purpose

The *STREAM Journal* is published quarterly to promote participation, communication and policies that support the livelihoods of poor aquatic resources users in Asia-Pacific, and to build links within the aquatic resources management and other sectors across the region. The *STREAM Journal* covers issues related to people whose livelihoods involve aquatic resources management, especially people with limited resources, and government, non-governmental and international practitioners who work with them in communities. Such issues include learning, conflict management, information and communications technologies, aquatic resources management, legislation, livelihoods, gender, participation, stakeholders, policy and communications.

Another equally important purpose of the *STREAM Journal* is to provide an opportunity for seldom-raised voices to be heard and represented in a professional publication that is practical yet somewhat academic. The contents of the *STREAM Journal* should not be taken as reflecting the views of any particular organization or agency, but as statements by individuals based on their own experience. While authors are responsible for the contents of their articles, STREAM recognizes and takes responsibility for any editorial bias and oversights.

Distribution

The *STREAM Journal* is available in three formats:

- An electronic PDF version which is printed and distributed by the STREAM Communications Hubs in each country
- A version which can be accessed and downloaded in PDF format from the Virtual Library on the STREAM Website at www.streaminitiative.org, and
- A printed version which is distributed by the NACA Secretariat.

Contribution

The *STREAM Journal* encourages the contribution of articles of interest to aquatic resources users and people who work with them. The *STREAM Journal* also supports community-level colleagues to document their own experiences in these pages.

Articles should be written in plain English and no more than 1,000 words long (about two A4 pages of single-spaced text).

Contributions can be made to William Savage, *STREAM Journal* Editor, at <savage@loxinfo.co.th>. For more information, contact Graham Haylor, STREAM Director, at <gghaylor@loxinfo.co.th>.

About STREAM

Support to Regional Aquatic Resources Management (STREAM) is an Initiative designed within the five-year Work Program cycle of the Network of Aquaculture Centres in Asia-Pacific (NACA). It aims to support agencies and institutions to:

- Utilize existing and emerging information more effectively
- Better understand poor people's livelihoods, and
- Enable poor people to exert greater influence over policies and processes that impact on their lives.

STREAM will do this by supporting the development of policies and processes of mediating institutions, and building capacity to:

- Identify aquatic resources management issues impacting on the livelihoods of poor people
- Monitor and evaluate different management approaches
- Extend information, and
- Network within and between sectors and countries.

The STREAM Initiative is based around partnerships, involving at the outset a coalition of founding partners (AusAID, DFID, FAO and VSO) supporting NACA. It has adopted an inclusive approach, reaching out to link stakeholders engaged in aquatic resources management and supporting them to influence the Initiative's design, implementation and management.

The partnerships' work is coordinated in each Country Office through a National Coordinator (a senior national colleague agreed with the government) and a Communications Hub Manager (a full-time national colleague supported in the first two years by STREAM), and linking a range of national stakeholders. The Communications Hub is provided with hardware, software, training, information-technology support, and networking and human resources support, and links national stakeholders through an internet-based virtual regional network.

National coordination is guided by an annually-reviewed Country Strategy Paper (CSP) drawn up by the Coordinator and Hub Manager in consultation with stakeholders with whom they regularly network. A CSP identifies key issues, highlights regional linkages, proposes and prioritizes key actions, and seeks funding for these from STREAM and elsewhere (with STREAM support).

The STREAM Regional Office (at the NACA Secretariat in Bangkok) directs the Initiative, provides a regional coordination function, and funds and manages cross-cutting activities dealing with livelihoods, institutions, policy development and communications, the four outcomes-based STREAM themes.

STREAM implementation is an iterative process, initially operating in Cambodia, India, Indonesia, Lao PDR, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Vietnam and Yunnan, China, and expanding within Asia-Pacific where opportunities exist to tackle poverty and promote good governance, as experience is gained, lessons are learned, impact is demonstrated and additional funding is secured. STREAM's communications strategy aims to increase impact by ensuring that existing knowledge and expertise inform ongoing change processes around the region, and that the lessons learned are disseminated throughout Asia-Pacific. The *STREAM Journal* and the STREAM website are components of this strategy.

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