

# Local Scale Arapaima Fish Management in the North Rupununi, Guyana: lessons learned

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Sign at Kwatamang Boat Landing declaring Arapaima Management Area. ©NRDDB, 2009

## Introduction

Population levels of Arapaima (*Arapaima gigas*), a tropical fresh water scaled-fish found in South America, have been declining over the last 40 years due to overfishing. Their large size (2 m length and over 100 kg) and boneless meat have made them prone to overfishing. Overexploitation, despite protection of the species by law, made Arapaima almost locally extinct in the Rupununi savannahs of Guyana. In 1998, communities in the North Rupununi began taking steps to conserve Arapaima numbers including community awareness campaigns, placing a local ban on all fishing of the species, the development and implementation of a management plan intended to ensure the recovery of the species but also bring benefit to the people. In 2007, the Arapaima Management Plan (AMP) was approved by the Government of Guyana, as part of the Fisheries Act..... The AMP represents the first of its kind in Guyana. The implementation of the Management Plan has been funded in part by many organisations. The initial funding after the approval came from WWF Guianas and IUCN NL Ecosystem Grants Programme (EGP) to begin the implementation of the plan in its entirety. Here we discuss valuable lessons learned from implementing the management plan, which may prove useful for other future fish-management initiatives in the local area and elsewhere.



Arapaima Counters and Harvesters in Twine Pond, Rupununi River. ©NRDDB, 2010



Arapaima Harvesters at Makapa Sandbank, Rupununi River. ©NRDDB, 2010

## The Place and the People

The North Rupununi Wetlands is a highly bio-diverse region that sits at the edge of two ecologically different basins; the Amazon Basin and the Guiana Shield. Over 1400 vertebrate species have been identified in the area. The wetlands are a seasonally flooded system that is under water for almost five months of the year. The North Rupununi Wetlands is extremely important as it is where many fish species come to spawn every year.

The Wetlands is also the home of the Makushi people. The North Rupununi comprises sixteen communities with a population of over 6000 people. People of the Rupununi are still highly dependent on the land for their livelihood. Fishing, farming and some hunting is the main source of food for the Makushi. With guidance from conservation organisations Makushis' are taking steps to use their land and resources as investment capital in improving ecotourism and other related businesses for their economic security. The sixteen communities have come together to form a representative body, the North Rupununi District Development Board, to foster the links between the communities, government agencies and Iwokrama International Centre for Rain Forest Conservation and Development. Today the NRDDB also provides a forum for discussions and decision making among village leaders.



Kwatamang Village, North Rupununi during the rainy season. ©D.Jafferally, 2011



Annai Village, North Rupununi in the rainy season ©S. James, 2011

## Arapaima Management

Arapaima is found only in the Amazon and Upper Essequibo River Basins in Guyana. Arapaima can reach up to three metres in length and 200 kilos in weight. Arapaima harvesting is forbidden (Fisheries Aquatic Wildlife Control Regulation 1966) in Guyana; unfortunately, in the last 40 years, illegal fishing has drastically decreased the Essequibo Arapaima population. Today, the scarcity of Arapaima is reason for concern for both local Amerindian communities and conservation organisations because of its importance economically and ecologically.

In 2002 the (NRDDB) in collaboration with the Iwokrama International Centre and Department of Fisheries began a program focused on the effective management and recovery of the Arapaima population. The program involves stock assessments, community outreach, and the long term provision of benefits to local communities through the sustainable use of Arapaima. This program aimed to achieve its objectives through the approval and implementation of an Arapaima Management Plan.



A mature male Arapaima (1.7 m) from Rewa Village, North Rupununi. © D. Stewart, 2008



Fishermen preparing salted Arapaima product. © NRDDB, 2010

## Results

There were a number of objectives to implementing the Arapaima Management Plan. These included continuing the assessment of the Arapaima's population, keeping the communities engaged in the management process, carry out patrols to reduce illegal harvesting, begin the steps to building a business from legally harvested Arapaima.

**Population Assessment:** The population from the initial assessment has increased from 425 individuals over 1 m to an estimated 3300 individuals. Changes in weather pattern have made counting on a regular schedule difficult. Over the last 2 years the El Niño - La Niña weather phenomenon has in higher than normal water levels and has affected the time period when the population assessments are to be done. The fishermen prefer to count the fish when the lakes are completely cut off from the river system.

**Legal Harvest:** The increase in Arapaima population provided the impetus needed to attempt harvesting. They were granted a licence from the Department of Fisheries - Ministry of Agriculture to legally harvest 101 fish over 1.6 m in length. The fishermen were able to harvest only half of the quota. After evaluating the harvest it was determined that larger bows and arrows were needed to catch the fish. In addition, the level of experience where catching this particular species is concerned is low when compared to their Brazilian counterparts.

**Marketing:** There are limitations in marketing the fish; beyond the Rupununi and Brazilian markets. The fish is little known in the capital city that was identified as the market. Those who indicated interest wanted either the full quota immediately or just small amounts over a time. For this first attempt at harvesting this was beyond the ability of the fishermen to fulfil.

**Community Outreach:** Keeping the momentum and the communities' interest in the management plan has been a battle. Approval of the plan was delayed until the passage of the new Fisheries Act. This long time period from the development of the plan to its approval shifted communities' attention to other matters especially the potential impacts of improving access to their area.

**Management:** Finding strong leadership to carry the management plan and build the business has been difficult.

**Financing:** Securing a steady source of finance to implement the management plan has been difficult, some funding agencies are only willing to fund monitoring and community related issues in the plan.

## Lessons Learned

**Population Assessment:** the count methodology has been effective in providing the number on the fish population. The time of counting is becoming an issue with the changes in the weather pattern. An assessment will have to be made on what changing the time of the counts would mean in understanding the true level of the population density and distribution.

**Management:** the capacity needed to implement the management and other such systems have to be built. There are only a few resource people capable of implementing the plan currently and they are already taxed. Community members also need to be empowered to take ownership for managing their resources. The project implementation has shown that some amount of decentralisation is needed from the NRDDB to the communities for the system to work. The management structure set up in the management plan cannot effectively work without financial support.

**Harvesting:** This first harvest provided the opportunity to test and identify the flaws in the management system that was developed. This was the first occasion the NRDDB had to evaluate the Arapaima Management Plan and engage the communities in discussion on how to fix the issues that arose.

**Marketing:** the marketing has been difficult. Communities should therefore stick to what they know until the business has been established. As the business is built efforts can be made to expand to other markets.

**Financing:** Communities need to devise a strategy of how to finance the management plan on a long term basis.

**Outreach:** Outreach should not only be just to the communities, other stakeholders need to be included as well. This is particularly true of the Department of Fisheries. Their involvement in the process should be more than issuing permits. The communities need to engage the Department so that their input is more meaningful and the co-management becomes more effective.

## Management Actions

The management plan is based on a similar, successful system in Brazil. The system relies on determining the number of individuals to be harvested based on the annual counts of Arapaima. This management system proceeds as follows: (1) The number of Arapaima is counted in all managed lakes at the beginning of every dry season; (2) The count is analysed in relation to other counts and harvest information from previous years and it is determined whether the population is growing, is the same, or is decreasing; (3) Based on the count and monitoring information a number of individuals to be harvested is determined; (4) The individuals to be harvested are shared among the fishermen; (5) The fishermen harvest the Arapaima; and (6) The harvest is sold. A complete run of the management plan was funded by the IUCN NL Ecosystem Grants Programme (EGP) from 2009-2010. WWF Guianas has funded the population assessments and community engagement since 2007.