

Community-Based Fisheries Management: A Case Study of Fishing Communities from Ortoire to Guayaguayare, Trinidad.

ROSEMARIE. KISHORE, AND HIMAWATEE. RAMSUNDAR,
Institute of Marine Affairs, P.O. Box 3160, Carenage Post Office, Trinidad, W.I.

ABSTRACT

This research focuses on the development of community-based fisheries management in fishing communities from Ortoire to Guayaguayare, Trinidad and examines factors such as the nature of the fishery, the socio-cultural environment, and the development of community organisations which are intrinsic to this community-based approach. Research methodology included the use of face-to-face interviews guided by questionnaires to capture information on fishing operations, fisher households, and a perception and attitude survey on resource conditions and fisheries management issues. Other research techniques included the use of key informants, focus group meetings, and cognitive mapping of fishing grounds and fish resources. The shared fishing areas, similar fishing methods and seasonal nature of the artisanal fishery facilitate a migration of boats and fishers across the seven fishing landing sites. This migration and the kinship among the fishers contribute to strong social cohesion, which supports the concept of a single fishing community. The formation of two fishing associations, and the fishers' ability to negotiate on their own behalf with other resource users, allow for these fishing communities to engage in a participatory approach with government, research institutions and other resource users in developing a framework for managing the local fishing industry from Ortoire to Guayaguayare.

KEYWORDS: Community-based fisheries management, artisanal, Trinidad

Gerencia Comunidad-Basada De las Industrias pesqueras: Un Estudio de Caso de las Comunidades de la Pesca de Ortoire a Guayaguayare, Trinidad

Esta investigación se centra en el desarrollo de la gerencia de las industrias pesqueras de la comunidad- base en comunidades de la pesca de Ortoire a Guayaguayare, Trinidad y examina factores tales como la naturaleza de la industria pesquera, del ambiente socio-cultural, y del desarrollo de las organizaciones de la comunidad que son intrínseco a este acercamiento de la comunidad-base. Investigue la metodología incluye el uso de las 'entrevistas cara a cara dirigidas por los cuestionarios a la información de la captura sobre operaciones de la pesca, casas del pescador, y una encuesta sobre la opinión y la actitud en condiciones del recurso y ediciones de gerencia de las industrias pesqueras. Otras técnicas de la investigación incluyeron el uso de los informadores dominantes, reuniones del grupo principal, y trae cognoscitivo de los recursos de las zonas y de los pescados de pesca. Las zonas pesqueras compartidas, los métodos similares de la pesca y la naturaleza estacional de la industria pesquera del pescador facilitan una migración de barcos y de pescadores a través de los siete sitios de pesca del aterrizaje. Esta migración y el parentesco entre los pescadores contribuyen a la cohesión social fuerte que apoya el concepto de una sola comunidad de la pesca. La formación de dos asociaciones de pesca, y la capacidad de los pescadores de negociar en su propio favor con otros a usuarios del recurso, permiten para que estas comunidades de la pesca enganchen a un acercamiento participante con el gobierno, las instituciones de investigación y otros usuarios del recurso en desarrollar un marco para un manejo de la industria de pesca local del Ortoire al Guayaguayare.

PALABRAS CLAVES: gerencia de las industrias pesqueras de la Comunidad-base, artisanal, Trinidad

INTRODUCTION

The essential idea of co-management is the sharing of decision-making and management functions between government and stakeholders in the fishery (Charles 2001). The involvement of users in the decision-making process has been a recent initiative and Chuenpagdee *et al.* (2004) attributes this partly to the Rio Declaration in 1992, specifically Agenda 21, which marked one of the first global initiatives to recognise the importance of involving people in addressing environmental and developmental issues. The co-management approach for managing fisheries resources in CARICOM countries has received more attention in only recent times and co-management initiatives have only just begun (Brown and Pomeroy 1999, McConney *et al.* 2003), when compared to well-documented cases in other

countries. Chakalall *et al.* (1998) noted that the difficulty faced in monitoring the fisheries and enforcement of regulations of widely scattered small-scale rural fisheries typical of CARICOM countries, have led to the upsurge of interest in co-management and community-based management.

Fisheries co-management in Trinidad and Tobago is less advanced than many of the CARICOM countries mainly because the current legislative framework does not allow for the participation of industry stakeholders in the managing of the fisheries. Management of the fisheries resources is still through traditional and limited strategies such as restrictions on the size of mesh sizes of gillnets and zoning for the trawl fishery and is effected through the Fisheries Act of 1916 and its amendments of 1975

(Chapter 67:51). Limited and restricted entry of new vessels in the trawl fishery, both artisanal and industrial, has been implemented through a 1988 decision of Cabinet (Kuruvillea *et al.* 2000). The commercial marine fisheries of Trinidad and Tobago are characteristically open-access, multi-species and multi-gear. The fisheries are predominantly artisanal with small fleets of semi- and industrial trawlers, semi-industrial multipurpose boats, and a burgeoning industrial long-line fleet. Several commercially important fish and shrimp species have been assessed to be over-exploited or fully exploited (Kuruvillea *et al.* 2000, Manickchand-Heileman and Phillip 1992, Soomai *et al.* 1999) and the fisheries resources are also threatened by habitat loss and environmental degradation as well as increasing conflict with other coastal resource users.

In recognition of the need to adopt a new approach, new policy guidelines (1990s) for the marine fisheries sector sought to address deficiencies in the existing fisheries legislative framework and management approaches to suit the changing needs of the fisheries sector including stakeholders' involvement in the management process (Fisheries Division 1996a). However they have never been formalised and again new policies and legislation are currently being developed, as a result the fisheries sector is still regulated by the Fisheries Act Chapter 67:51.

Despite the absence of a legal framework, the government of Trinidad and Tobago is not averse to stakeholder involvement in the fisheries sector and there are some mechanisms through which participation by industry stakeholders has taken place. Interventions by Government has been mainly through institutional strengthening and capacity building mechanisms, like that of the FAO/UNDP Integrated Coastal Fisheries Management Project which sought to develop improved methodologies and coordinating mechanisms for integrated coastal fisheries management (Fisheries Division 1994), and the training of government and industry stakeholders for the purpose of participating in the fisheries management process (Fisheries Division 1996b), through programs like the Community Involvement and Education subproject of the CARICOM Fisheries Resources Assessment Program (CFRAMP), a regional intergovernmental initiative supportive of co-management.

Interventions by the industry stakeholders have been more direct as a consequence of user conflicts within the fishing industry. One of the major initiatives in 1996 was an agreement between fishers and the government which sought to promote the sustainable management and optimal utilisation of the inshore fisheries resources on the north, south and west coasts of Trinidad. This agreement established new zoning for trawlers, gear restrictions and no-fishing zones (Fisheries Division 1997). The resulting Monitoring and Advisory Committee (MAC) comprising representatives from the fishing industry, fishing regulatory agencies and research institutions represents the first initiative of co-management at a national level. Twice there have been changes to the composition of the MAC how-

ever there is no representation from the east coast of Trinidad or from Tobago.

McConney *et al.* (2003) sees co-management arrangements in the distribution of authority between government and stakeholders as a continuum from government-based management through to community-based management. Charles (2001) presents community-based management as a co-management arrangement on a geographic basis and noted that when resource users live in close proximity to the exploited resources there are enhanced conservation and socio-economic benefits. He also noted that community-based co-management seems to depend on two criteria: the approach must be feasible and the government must perceive community-based management positively. The feasibility of the approach depends on a variety of factors including the fundamental nature of the fishery (e.g. small-scale community-based or industrial), the nature of the resource base, the socio-cultural environment, the nature of the social cohesion in the community and the strength of community institutions.

Phase II of the regional Community-Based Coastal Resources Management Project (CBCRM) project funded by the International Research Centre of Canada (IDRC) with technical support from IOI-Costa Rica, CARICOM Fisheries Unit and Laval University supported 15 projects from the Caribbean and Latin America. One of its main goals was to promote greater involvement of minority groups that depend upon the coastal resources for their livelihood but have traditionally operated at the margins of the planning and decision-making process. The project from Trinidad and Tobago sought to investigate the fisheries resources, resource users and fisheries management

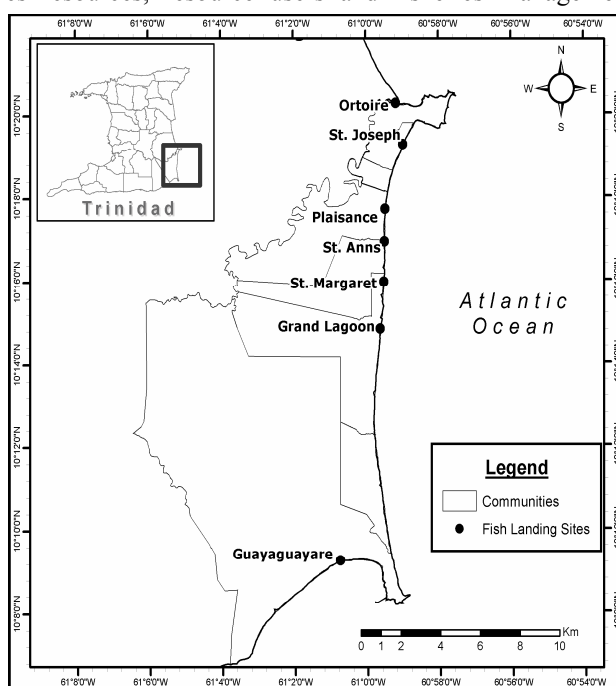


Figure 1. Fish landing sites and communities on the Southeast Coast of Trinidad.

systems of fishing communities on its southeast coast to establish a framework for co-management. This paper based on the project examines the community-based co-management initiative which has occurred in the fishing communities on the southeast coast of Trinidad and evaluates it based on the criteria set by Charles (2001) for contributing to new fisheries management strategies in Trinidad.

METHODS

Description of study area

There are seven fish landing sites in the villages of Ortoire, St. Joseph, Plaisance, St. Anns, St. Margaret, Grand Lagoon and Guayaguayare on the southeast coast of Trinidad, which are part of a larger community of approximately 11,000 (CSO 2002), Figure 1. Several of the communities are collectively called Mayaro; together with Ortoire and Guayaguayare they are considered the main communities in the study area. The area is bounded on the east and south by the Atlantic Ocean and the Columbus Channel. There is a mixture of rural and urban characteristics, including social amenities such as a hospital, police station, banks, schools, markets, restaurants and recreational facilities. Considerable industrial development and related infrastructure support the onshore and offshore oil and gas sector. Since the 1990s, there has been a resurgence of the tourism industry on the east coast. The more significant economic activities on the southeast coast are oil and gas production, tourism and fishing. (Kishore *et al.* 2005).

Data Collection

Participation by the fishers was encouraged initially through the used of PowerPoint presentations on the goals and objectives of the project, at community meetings, focus group meetings, and one-on-one consultations engendering feedback. Additionally relatives of fishers were hired to collect primary socio-economic data on fishers. These fora and personal observations were also used to identify key leaders in the fishing community. A participatory approach was taken in developing a co-management framework for the fishing industry involving several stake-

holders including fishers, researchers from the Institute of Marine Affairs and fisheries extension staff of the Fisheries Division.

In assessing the feasibility of the community-based co-management approach based on Charles (2001) both primary and secondary data collection were used to characterise the nature of the fishery and resource base, the socio-economic environment, fisher cohesiveness and political organisation of the fishing communities of the southeast coast of Trinidad. Primary data collection through the use of face-to-face interviews guided by questionnaires were used to capture information on the characterisation of the fishing operations and market structure of the exploited fisheries, the demographic and economic status of the fishers and fisher households, the role and status of women within the fisheries system and fisheries local knowledge inclusive of a perception and attitude survey on resource conditions and fisheries management issues. Data was collected from January 2003 to April 2004 and the co-management framework workshop in November 2004. Other research techniques included the use of key informants, observation, focus group meetings, and cognitive mapping of fishing grounds and fish resources. Survey data were collated in MS Access and analysed using MS Excel. Geographical data inclusive of fishing area maps were digitised, collated and analysed using ArcGIS 9.1.

RESULTS

The feasibility of the community-based co-management approach was assessed through the analysis of nature of the fishery and resource base, the socio-economic environment, fisher cohesiveness and political organisation of the fishing communities as well as the interactions among the primary stakeholders of the fishing industry on the southeast coast of Trinidad.

Nature of the Fishery and Resource Base

Fishing on the southeast is a traditional activity and was important for the villages as far back as the end of 19th century (Anthony 2001) when "all along the coast boats

Table 1. Evolution of fishing associations in southeast coastal fishing communities, Trinidad. (taken from Kishore *et al.* 2005).

| Fishing Associations | Description |
|--|---|
| South East Fishing Association (SEFA) | 2001 - Some members comprise a fishing sub-committee (now defunct) of the Mayaro Initiative for Private Enterprise Development (MIPED) which was funded by bpTTLCC. 2003 - Interim Steering Committee established by British Petroleum of Trinidad and Tobago (bpTTLCC), Committee comprise of fishers whose role was to liaise with bpTTLCC with respect to processing of claims for damage to fishing gear and boats. Jun 2004 - Formation of SEFA. Formed as a result of increasing conflict with the energy sector and the need to have collective representation. Membership of approx. 45 fishers (mainly boat owners from Ortoire to Guayaguayare) |
| Women in Fishing Association (WIFA) WIFA is the first women fishing association in T&T. | Aug 2004 - Direct intervention by the Institute of Marine Affairs. Following key informant interviews and a women focus group meeting in March 2004. IMA facilitated meetings from July 2004 to Jan 2005 Membership approx 30 women comprising boat owners and wives, relatives (including mothers) of boat owners. |

could be seen at sea piled high with nets as well as fishermen pulling nets ashore” Today there are approximately 350 fishermen operating from 92 boats out of seven fish landing sites Ortoire, St. Joseph, Plaisance, St. Ann’s, St. Margaret’s, Grand Lagoon and Guayaguayare, with main landing sites at Ortoire, Plaisance and Guayaguayare. The four fish landing sites from Plaisance to Grand Lagoon are in relatively close proximity and are located on the extensive Mayaro Beach, bordering the Atlantic Ocean. St. Margaret’s and Grand Lagoon are < 1 km apart because of their similarity, for the purpose of this assessment was considered as one. The fishery on the southeast coast is artisanal with pirogues ranging from 5.5 – 10.9 m involving the use of at least 12 fishing methods. The main fishing methods involve the use of gillnets (45%), banking lines (16%), trolling/towing (10%) and fishpots (9%). However the types of primary (main) fishing methods vary at several of the landing sites. At Ortoire and St. Joseph, fishpots and banking dominate, while at Plaisance, St. Margaret’s/Grand Lagoon and Guayaguayare, the use of gillnets is dominant. Although only involving about 9 boats, a traditional beach or land seine fishery is important to the fish landing sites from Plaisance to St. Margaret’s/Grand Lagoon and is the only area in Trinidad where beach seining is commonly practised. Although the fishers can be grouped based on their primary fishing methods, almost all boats (excluding the land seine) use at least three methods, and some up to five methods.

There are no mooring facilities and fishers tie their boats to trees near the coast or pull their boats up on the shore. In the case of Ortoire, the boats are kept in the river and at low tide are grounded and the fishers almost always have to wait for the high tide to exit to their fishing grounds. Due to the increasing incidence of theft of engines, these are now kept at the homes of fishers together with any related safety equipment and GPS receivers. At Guayaguayare, the fishers themselves have constructed storage sheds on the beach and the main fish landing area is at the home of one of the fishers where engines and gas is kept free of charge. At the start of the project, there were no Government-sponsored facilities for storage and vending and most of the fishers stored their engines at home or at specially built storage areas/shed for engine and fishing gear and storage bins. In most cases, nets are either left on the boats or on the banks of the river. During the life of the project, in 2004, the oil and gas company, British Petroleum of Trinidad and Tobago (bpTTLCC) donated money for the construction of a fish market at Ortoire for the wholesale and retail vending of fish. Later the Government through the Fisheries Division assisted in financing the completion of this fish market.

The fishers usually venture out on the southeast of Trinidad to distances in excess of 40 km. They use outboard motors on that trips that are completed within one day. Fishers are not usually away from their families any length of time, with the exception of some of the banking

fishing boats which are at sea for 2 days. The fishing grounds extend on the east coast (Atlantic Ocean), south coast (Columbus Channel) and occasionally the north coast (Caribbean Sea). The extensive continental shelf and the varied habitats such as muddy and rocky bottom substrates allow the fishers to target many different species utilising multiple gears. Fishers exploit as much as 51 species of fish, 10 species of sharks, 3 species of crabs from 3 families and one species of lobster. The main target species are the Spanish mackerel, *Scomberomus brasiliensis* locally called carite, and to a lesser extent, the kingfish *S. cavalla*, snappers (mainly *Lutjanus synagris* and *L. purpureus*), sharks (*Charcharhinus limbatus* and *Rhizoprionodon porosus*) the Caribbean spiny lobster, *Palinurus argus*, and the bluefish, *Pomatomus saltatrix* locally called ancho. Many of the gear types are used throughout the year but there is a definite temporal pattern in the use of these fishing methods. Such seasonality is dependent of the availability of the target species and in the case of the beach seine fishery is also dependent on the weather. The biggest seasonal change is in the gillnet fishery which comprise multifilament and monofilament nets. During the dry season from December to May the former is used while in the rainy season, the fishers switch to the monofilament net. The least seasonal of the fisheries is the fishpot fishery.

Almost all the fish is sold fresh due to a general lack of refrigeration facilities. There is very little organisation at the community level with respect to marketing of the fish, leaving the opportunity for vendors mainly to become involved. There are nineteen vendors, including six women, two of whom are boat owners, who service the fish landing sites from Ortoire to Guayaguayare. The few vendors from the area sell their fish locally at roadside stalls, market and one supermarket. Despite the availability of a new fish market at Ortoire, most of the boat owners in this village do not use the facility as they supply regular vendors who meet them on the beach. Most of the fish however is taken out of the area and sold to both wholesale and retail buyers including processing plants. Fish processing plants in turn export to CARICOM countries as well as sell the fish locally in the form of fillets to restaurants, supermarkets, hotels, caterers, and fast food outlets throughout Trinidad and Tobago.

Boat Migration

The boats’ activities are not confined to their homeport but freely operate out of different landing sites, Figure 2. Guayaguayare, both as a homeport and landing site, appears to be the most used of the seven fishing sites. The main reason for this is the carite season which runs from December/January to May. Additional reasons are the convenience of utilising a private storage facility (fisher owned) free of charged and ease of mooring boats and off-loading catch and gear in the sheltered Guayaguayare Bay. The carite first appears on the south coast and migrates up

and around the east coast and it is not uncommon during the carite season to see 30-35 boats (field observation) at any point in time off-loading their catch at Guayaguayare. As the Spanish mackerel migrates further up the east coast the boats return to their respective homeports and there is a subsequent decrease in the number of boats at Guayaguayare. During October to December there is a smaller migration of boats due to increased presence of the bluefish at Ortoire. A closer examination of the boat movements

and knowledge of the various fishing methods used, show that this migration or mobility of the boats is mainly due to gillnets which follow the carite.

Concomitant with this boat mobility is the mobility of the fishers. The landing of fishers at different landing sites allows them to mingle, share information and develop social networks which are not necessarily restricted to their communities. In Trinidad, this has contributed to the whole community concept of "Ortoire is Mayaro is Guay-

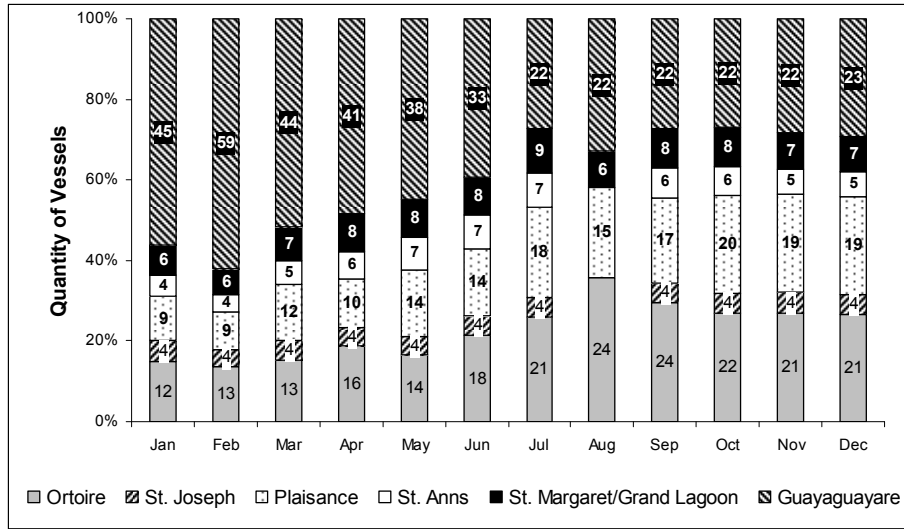


Figure 2. Monthly variation of fishing boats at landing sites on the Southeast Coast of Trinidad.

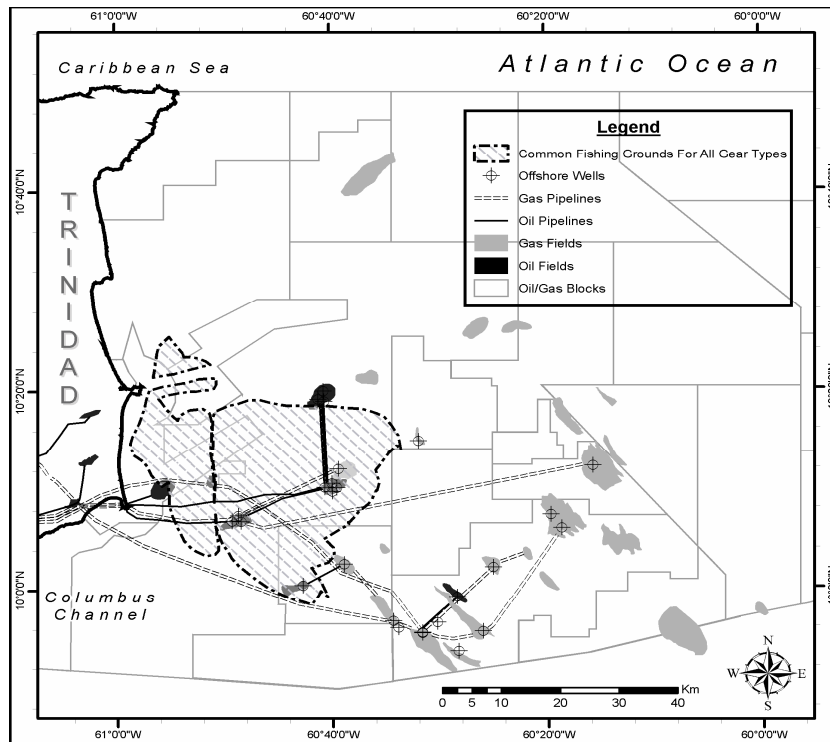


Figure 3. Common fishing grounds in relation to oil and gas blocks, fields and energy sector infrastructure off the East Coast, Trinidad.

aguayare". This mobility is also advantageous to the boat owners as they obtain better prices because of the auctioning system among the vendors as they following the catch. Increased social and economic activity is observed at the Guayaguayare and Ortoire landing sites with seasonal migration.

Socio-economic environment

The fishers as a group are not homogenous and may be placed in several categories or job classifications. There are boat owners, captains, crew, managers, scale-men, net builders and/or net repairers, jostlers, vendors (wholesale and retail) and engine repairers. In addition these positions can be either full-time or part-time or transient. While the majority of fishers are men the involvement of women contributes to the heterogeneity seen in this group. The role and status of the boat owner is very powerful as this person decides who gets employment on the boat. There are full-time boat owners who go out to fish with their crew as well as part-time boat owners who work elsewhere. Eighty-three of the boats in the survey were owned by 50 fishers. About 50% of these boat owners own more than one boat; some may own up to four boats. Most crew members live in fishing communities adjacent to the landing sites but some live in the wider community that span from Ortoire to Guayaguayare.

The early pioneering women in the fishing industry as well as the daily interaction of fishers with their women folk may be accountable for the more active role women play in all aspects of the southeast coast fishery. Here, women are boat owners, managers of the fishing activity on behalf of their fisher husbands or sons. They are involved in fishing groups and community organizations which promote fishers. This is in addition to their more traditional roles of fish processors and vendors. Indeed for 30% of the households interviewed, women played an active role in fishing, selling of fish and mending of nets for income generating purposes.

Other job opportunities on the southeast coast of Trinidad provide part-time employment for 49% of the fishers interviewed. These are both skilled and unskilled jobs such as working in the oil and gas sector, agriculture, construction and as life-guards. Of the 50 boat owners, 50% are engaged in other forms of employment other than fishing. Three of the boat owners (who own 7 boats) own companies which service the energy sector and one other is a real estate developer. There is a perception that fishing is usually a job of last resort, however this research has shown that entry into the fishery required a capital investment of \$TT44,000 - \$TT 81,000 (\$TT 1 = \$US 6.3) depending on the gear. Reason advanced for working in the fishing industry include 43% of the fishers who saw fishing as the only option for them while 21% saw it as a profitable source of income. Income for the household is largely generated by activities contributed by the males, however in the case of Plaisance, women contribute to ap-

proximately 32% of the households. Fishing contributed > 60% of the income of 71% of the fisher household surveyed. Thirty-seven percent of the fishers did not have an alternative to fishing if they were prevent from fishing. There is a scarcity of young people entering the fishing industry and unwillingness to allow family members to get involved in the industry. Coupled with the availability of other job opportunities it is difficult to obtain crew members for fishing trips, particularly those who will stay in the fishing industry other than on a temporary basis.

Fisher Cohesiveness and Political Organisations

In assessing social linkages within the communities, it is interesting to observe the role of family relations within the fishing experience. The family group does not dominate the boat unit, as boat crews and owners are primarily unrelated. However there is a high degree of kinship among the fishers as 63% (N=83) of the fishers interviewed indicated that they were related to other fishers either at the homeport of another landing site within the study area, while 46% were found to have their kin operating from the same homeport. Both Ortoire and Plaisance have a higher degree of kinship among the fishers. In addition, fishers' relatives especially the women, usually assist the fisher in the management of the fishing operations when the fisher is temporarily absent for any reason. Fishers have a strong connection to their community as 62% of the fishers interviewed were born in their respective villages and of those who had immigrated (22%) most of whom have lived more than half of their lives in these communities.

An assessment of the interaction of fishers within a homeport shows that 92% of the fishers view these interactions as positive, which is slightly higher (84%) when compared to interaction within a homeport. Interactions within a community are expected to be of a more intimate nature and so differences can be greater. Most of the negative interaction comes from fishers at Ortoire who agree that there is a communication problem with each other.

At the start of this project the fishing industry on the southeast coast was largely unorganised with the absence of any formal fishing associations. Two fishing cooperatives existed over 20 years ago in Mayaro Fishers were part of the cooperative at that time have noted several reasons for their demise including lack of trust and misappropriation of funds. At the start of the project, a fisher household survey (N=83) indicated <10% of fishers or members of their household belonged to community organisations or associated with groups with special fishing interests. However in recognition of the need to improve their livelihood and to obtain representation as well as the increasing conflicts with the oil and gas sector, in 2004, the fishers formed the Southeast Fishing Association (SEFA), Table 1. Another group, the Women in Fishing Association (WIFA), a direct initiative of this project, was formed in 2004, and is the first women's group involved in fishing

in Trinidad and Tobago. Members in these two organisations include fishers and family members from Ortoire to Guayaguayare.

The inherent beliefs of contributing to the fishing industry as well as to the social linkages which exist within the communities also contribute to the formation of these fishing organisations. Central to the formation of these local fisheries committees is the involvement of key leaders among the fishing communities. SEFA began with several boat owners from Ortoire to Guayaguayare who were members of previous fishing committees (Table 2). Some key leaders are well known throughout the fishing communities and also belong to the Mayaro Business Council. They have strong links with the energy sector either through part-time employment or provide service to the energy sector through their private companies. The trust of the fishers as well as the energy sector, for these key leaders was pivotal in the formation of SEFA. WIFA's executive comprises boat owners and wives of some of these key leaders who are also respected in their own right. Both organisations have gained the acceptance of the wider community reflected in invitations to participate in training sessions, meetings and formal openings of community projects. Such acceptance particularly of WIFA a fledgling organisation is encouraging and would help to discount the traditional taboo against women's involvement in the fishing industry.

Conflicts among the gear types by fishes on the south-east coast are an incentive for co-operation. As it stands however the fishers have managed to avoid any disputes or confrontations. There is a taciturn agreement among fishers if someone else's fishpots are recovered while fishing, one can take the fish and replace the pot on the sea floor or bring the pots ashore. Although beach seines owners complain about the blocking of their nets by gillnets and the often times invasion of community members in their nets this has not been an issue which has been openly voiced. It appears it is more difficult to address such issues among the fishers themselves and will require strengthening of the newly formed fishing association through capacity building and developing skills in negotiation. In addition there is a growing apprehension between the two newly formed fish organisations as perceived overlap in representation on fishers concerns will require co-operation and compromise.

Stakeholders Involvement in the fishing industry

The lack of representation of the area on the MAC has meant that fishers only relate with the government regulatory agency, the Fisheries Division, through its fishery extension personnel. The Fisheries Division has had perennial problems of budgetary constraints for its extension services. This reduced interaction has resulted in isolation, which is detrimental to the fishing industry in the area as it results in reduced political visibility at the national level. Many of the fishers feel that the Government and the Fisheries Division do not care about their interests as evidenced

by the lack of facilities in the area and limited incentives for the fishers in general. Fifty-seven percent fishers were concerned about the lack of facilities and economic concerns as compared to 12% having concerns about the impact of the energy sector on the fishing industry.

The fishing grounds are also areas where most of the oil and gas is extracted. The common fishing areas for all geotypes combined, Figure 3, create the potential for further conflict as east coast oil and gas extraction and exploration is intensified. There has been gentle persuasion by the energy sector for the fishers to avoid the vicinity of oil rigs located in their fishing grounds. In spite of misgivings towards forming fishing organisations, the increased conflicts with the energy sector during the period 2002 -2004, the fishers realised they needed to have a stronger representation through the formation of the Southeast Fishing Association (SEFA). The conduct of a seismic survey by British petroleum Company of Trinidad and Tobago (bpTTLCC) in April 2004 catapulted the key leaders in the fishing community to negotiate with bpTT to provide compensation for damaged fishing gear and prevention of subsequent damage to boats and nets by installing radar reflectors on their boats. Another measure for reducing the damage included the provision of safety equipment such as lifejackets and funding a safety at sea training program. In 2004, 175 fishers were trained and a subsistence of \$1000 was paid to offset loss of income while attending the course. In 2005/2006 continued negotiations between WIFA and SEFA with bpTTTLCC resulted in compensation for loss of fishing days for all the boats during the seismic surveys in 2004 and again in 2005. Another oil company, Petrotrin, paid the fishers in 2005 so that they would not fish during the conduct of another seismic survey.

The conflict with the energy sector spurred discussions between SEFA and bpTTTLCC for additional amenities for the fishers, as part of a framework for interaction between the fishing industry and the bpTTTLCC. There have been additional safety at sea training courses, each fisher has received a hand-held GPS receiver for his fishing operations, and there has been the promise by bpTTTLCC for the provision of fishing facilities at Guayaguayare inclusive of a gas station which SEFA has intention of managing. bpTTTLCC has also invested over \$TT7 million for the Mayaro Initiative for Private Enterprise Development (MIPED) to develop entrepreneurial activities in the larger community. The vendor market at Ortoire was established under this initiative which also offers loan facilities to the fishers up to \$TT100,000.

WIFA received funding from BHP Billiton, another energy company for participation in two fish processing courses as part of their goal, towards owning a fish processing plant. WIFA has also obtained funding from REP-SOL YPF and British Gas Trinidad and Tobago Limited (BG TT) for certificate courses in engine repair and net mending as well as organised an engine repair course

funded by the Fisheries Division. Both men and women have participated in these courses. WIFA along with other community groups has also participated in courses on capacity building, proposal writing and environmental management funded and facilitated by bpTLLC and the Ministry of Community Affairs and Gender Development. In 2004/2005 WIFA raised funds through the sales of lunches and supplemented with funds from the energy sector, hosted Christmas parties for children of fishers and donated hampers to the elderly fishers. In addition, the fishing community has also benefited from community initiatives from other energy companies over the years.

The starting point of the project for the IMA was that of building relationships with the communities through meetings with the fishermen from the main fish landing sites and organisations related to fishing. The project was introduced in a very visual format. Prior to this, the IMA's previous work in the study area had been directed to environmental impact assessments (EIAs) for oil and gas companies. There was still a degree of reluctance and apathy by some of the fishers as they felt that they were a neglected part of the society as evident by the lack of physical infrastructure to assist them in their fishing. As a result, there were varying levels of acceptance of the IMA by the fishers. Relationship building and acceptance by the fishing community took approximately one year.

Much of this acceptance was gained through meetings, one-to-one interactions, focus groups, workshops, personal interviews and observations during the data collection process. Recognising and working with key leaders was also vital in this relationship building. The IMA also met with the fishers at their convenience as every day is an opportunity to fish with an average down time of one week during the year. This constant occupation with fishing was also a factor in extending the time taken to build the relationship and collect primary information from the fishers. Working with the fishers both in developing the co-management framework and assisting to establish WIFA, contributed to the trust built between the IMA and the community. Preparation of maps of the fishing grounds to aid in their navigation, as well as representing some of their immediate concerns at a national level (MAC) also assisted in the relationship-building.

Initially, it was envisaged that there would be greater participation in the data collection by community members; however the length of time it took to build strong relationships as well as day to day activities which consumed much of the fisher's time, restricted data collectors to community members (family members of fishers) who collected most of the household survey data. Towards the end of the project when the co-management framework workshop was conducted, there was eager participation by the key leaders. In addition the IMA has also interacted with the bpTLLC, who also provided the venue for the workshop free of charge and there was the participation of the Fisheries Division in the co-management framework

workshop. Since 2005 at their request, IMA has continued to interact and work with WIFA.

DISCUSSION

Central to the concept of community-based management is the concept of community. Jentoft *et al.* (1998) noted the more traditional notion of community as webs of social interaction tied to place, history and identity in contrast to the virtual or functional community (based on shared activities over larger geographical scales), upon which is based the concept of co-management. There is a phrase "Ortoire is Mayaro is Guayaguayare" articulated by the larger community which the fishers readily accepts as community members. The fishing operations; small-scale, shared fishing grounds and in particular the boat mobility reinforces this, allowing the fishers to see themselves as a single fishing community. This factor together with the high degree of social cohesion (through kinship, crew composition, family interaction and women participation) and vibrant fishing institutions supports the community-based management approach for the fishery on the southeast coast. The functional community of fishers who target the more sedentary shellfish resource, lobsters, can be specifically targeted together with other fishers of the east coast using a community-based approach as most of the exploitation of this resource in Trinidad is concentrated in this region. In addition, the localised beach fishery can be a candidate for local area management involving the fishers as well as the tourism sector as this area is also heavily used for local tourism.

The contribution of the fishing operations to the definition of community however cannot be understated. Examination of four fish landing sites on the west coast of Trinidad identified that conflict among the fishers was the major problem despite the nearby location of the country's largest industrial estate (Kishore 2003). The fishers themselves live in adjacent communities and some are related. This scenario of fish landing sites in close proximity to heavy industrial activity is similar to what exist for Ortoire to Guayaguayare. However the scale for both areas are very different; the fish landing sites on the west are within a span of 6 km and most of the shared fishing grounds are less than 10 km from shore whilst the distance between Ortoire and Guayaguayare communities is approximately 20 km and the fishers frequent areas more than 40 km from shore. A re-examination of the movement of the fishing boats at these sites on the west coast showed that almost all the boats set out and return to their homeport and boat migration is almost non-existent as landing at another site is more the exception than the rule. The times of the fishing trips are different, with the exception of two fishing sites, the primary fishing methods are also very different. It is therefore suggested that these differences in the fishing operations do not contribute to the fishers working together and the two functioning fishing organisations at that time; one a cooperative and the other an association, only represented fishers at the respective landing site.

The geographic specificity of the community-based approach must be appreciated and the design of any interventions must take this into consideration. The integrated coastal fisheries management project for the Gulf of Paria conducted in the early 1990s was very extensive covering the entire west coast of Trinidad. An assessment of this project by Chan a Shing (2001) suggested that the geographic area was too large with many sectoral interests and given the one-year time frame was difficult to implement some of the strategies as well as develop options for establishing a legal framework with appropriate stakeholder representation. Although many of the objectives of the two projects were different, the scale of the geographic area for this project was much smaller which reduced the complexity of the issues and facilitated co-management strategies. Chan a Shing (Ibid.) suggested that if the area for co-management was more formally defined, the implementation strategy may have been different and suggested that local level entities could have been encouraged to each deal with their own specific issues which would have affected the project output and contributed to the sustainability of the initiative. This and the work of this project reinforce the need to properly define the concept of community before attempting any such community-based management initiative.

In characterising the fishery and developing a co-management framework for the area, much of the process used to engage the fishers has been participatory, an approach which is characteristic of co-management strategies. Community-based management, however, has the advantage and opportunity, because of its focus on the community, to deal with management issues that impact directly on the communities. The fishing operations have a direct impact on the participation of the resources users. On the southeast coast of Trinidad, the day to day operations is a constraint to political organisation and participation as the boat owners, particularly those who go out to sea as well as those who are involved in other jobs, usually cannot spare the time. Notwithstanding, the fishing community has rallied among themselves to obtain redress from the oil and gas industry, which has led to the formation of the Southeast Fishing Association. Both SEFA and WIFA are the only two fishing organisations, which have interacted with the energy sector without the intervention of the Government and have received more than simple loss of income compensation from seismic survey as have the fishers on the west coast of Trinidad. These communities show that they are already using their own indigenous management arrangements to effect change. The fact that it is a geographically focused area with common fishing issues including conflict with another sector allowed the fishers to work together. In addition, women play a great role in the organisation of these fishing communities because of their working knowledge about the fishery and its opera-

tions as boat owners and managers and caretakers of the family, and their enthusiasm and motivation, as evidenced by their willingness to form a fishing association. At the start of the project many of the fishers were apathetic about getting involved in trying to improve conditions in the fishing industry however as they became more involved and saw some of the successes, their confidence and enthusiasm grew to more active participation in workshops and interacting more with other stakeholders. The ability to obtain benefits from the energy sector through negotiation created greater empowerment and improved the cohesion within the fishing communities. Empowerment is seen at the individual and community level and is both a condition and goal of fisheries co-management Jentoft (2005) which was also observed in this project.

The ability to assist in this transformation of the fishing community is one of the ways stakeholders like the IMA and the energy sector can play a role in this community-based management (CBM) process. Berkes *et al.* (2001) noted that with CBM, the government may play a minor role, co-management, on the other hand, includes a major and active government role. In addition other external agents such as NGOs, academic and research institutions as well as other coastal resource stakeholders can be part of this partnership. Due to the limited resources of fisheries agencies in Trinidad as well as other CARICOM countries, these external agents can be a valuable source for funding as well as providing empirical research for the co-management process and so relieve some of the burden on the central fisheries agency. Apart from this study, only one other project, FAO/UNDP Integrated Coastal Fisheries Management Project (Fisheries Division 1994), has documented the socio-economic environments of fishing communities in Trinidad and Tobago. If emphasis is going to be placed on involving the stakeholders in the management of the fisheries, then research priority should be given to the organisational and socio-economic aspects of the primary stakeholders, the fishers (Chakalall *et al.* 1998). In the absence of any coastal area management legal framework, another advantage of the involvement of external agents as in the case of the energy sector for this project, has been the dialogue and negotiation between coastal resource users particularly for Trinidad and Tobago where the energy sector contributes approx. 34% to the GDP (MOEEI 2005) and the fisheries sector 0.19% (last estimate) (Fisheries Division (2000).

Apart from the feasibility of the approach for community-based management, another criterion that is critical to the concept of community-based management as highlighted by (Charles 2001) is the receptiveness of Government to this approach. The establishment of the MAC can be interpreted as the government's receptiveness as its composition includes both fishing co-operatives as well as fishing associations. These fish-

ing associations are supposed to represent specific areas and by extension, communities, however it is unclear how this representation is effected. A motion in 2005 put forward by the IMA and accepted was for SEFA to represent the southeast coast of Trinidad on the MAC pointed a way forward for legitimising the community-based approach adopted in this project at a national level. Since then, the MAC has undergone changes which has seen its composition reduced so there is no representation from the east coast and Tobago and has reverted to its original composition when the MAC frame of reference was the north, west and south coasts of Trinidad. The establishment of the Seafood Industry Development Company (SIDC) in late 2006 and the formation of the Trinidad and Tobago United Fisherfolk (TTUF), a non-profit organisation whose aims is to represent all the fishers and fishing organisations in Trinidad and Tobago (T. Beddoe, Fishermen and Friends of the Sea, personal communication) are new stakeholders which can play a significant role in fisheries co-management in Trinidad and Tobago. The SIDC was established and is funded by the Government as means of revitalising the fish and fish processing industry and has as its chairman and board of directors, persons who are predominantly industry-based. The SIDC is not yet operational however SEFA and WIFA, facilitated by the IMA have been the first fishing organisations in Trinidad and Tobago to be addressed by SIDC's Chairman and board members. The TTUF is an initiative of several fishing associations in Trinidad and Tobago and has been in the making for the last 2 years with numerous consultations of the fishing industry. There appears to be an increase in the mobilising of the fishing groups in Trinidad and Tobago and the situation is very dynamic however this enthusiasm from the industry can diminish if proper support is not given. The proposed new fisheries policies and accompanying legislations should be the anchor for these co-management initiatives with the provision of a legal framework; however it is not anticipated that they will be ready in the immediate future as the review process has just begun.

The fisheries community-based co-management initiative recently developed in the communities from Ortoire to Guayaguayare is very new as many of the proposed plans have not been fully developed as yet. An assessment can only be done after it has been allowed to mature and as suggested by Mc Conney *et al* (2003) does not need to be dependent on inputs from external agents such as donors and researchers. Nevertheless much of the experiences of this project can be used to encourage the collection and analysis of data of the fishery systems inclusive of the socio-economic environments as well as building relationship with the fishing communities. In addition community-based management can develop and encourage capacity building in new and existing fishing organisations and so assisting fishing associations and communities in preparation for impending co-management initiatives for the fish-

eries sector of Trinidad and Tobago.

ACKNOWLEDGEMENTS

The authors of paper are extremely grateful to fishing communities of Ortoire, Plaisance, St., Joseph, St Ann's, Grand Lagoon, St. Margaret's, and Guayaguayare, for accommodating us over a 3 year period. and appreciate their participation in the project in the data collection, workshops and meetings and for unselfishly giving of their time. We are especially grateful to the executives of the Women in Fishing Association and the South East Fishing Association for assistance. The participation of the Fisheries Division, Ministry of Agriculture, Land and Marine Resources is also acknowledged. Special thanks to British Petroleum of Trinidad and Tobago (bpTT) for freely making available facilities at the Mayaro Resource Centre for the conduct of the co-management workshop. The authors are extremely grateful to project members S. Padmanabhan for his expertise in GIS and mapping and M. Clarke-Marshall and G. De Souza for their invaluable input. The review of this paper by J. Rocke is also acknowledged. The authors would also like to express sincere appreciation to the following agencies for financial and technical support: International Development Research Centre (IDRC), CARICOM Fisheries Unit, IOI-Costa Rica and Laval University, Quebec, Canada and the Institute of Marine Affairs.

LITERATURE CITED

- Anthony, M. 2001. *Towns and villages of Trinidad and Tobago*. Printmaster (W.I.) Limited, Marabella, Trinidad. 342pp.
- Berkes, F., R. Mahon, P. McConney, R. Pollnac, and R. Pomeroy. 2001. *Managing Small-scale Fisheries. Alternative Directions and Methods*. International Development Research Centre Ottawa, Canada. 309pp.
- Brown, D. N., and R. S. Pomeroy. 1999. Co-management of Caribbean Community (CARICOM) fisheries. *Marine Policy*, **23**(6):549–570.
- Central Statistical Office (CSO). 2002. *Population and Housing Census- Community Register*. Ministry of Planning and Development, Port-of-Spain, Trinidad. 138pp.
- Chan a Shing, C. [2001]. Case Study of the Integrated Coastal Fisheries Management Project: a Pilot Project for the Gulf of Paria, Trinidad. Technical Report No. 280. Unpubl. Caribbean Natural Resources Institute (CANARI). 13pp.
- Charles, A. 2001. Sustainable Fishery Systems. *Fish and Aquatic Resources Series 5*. London. UK. Blackwell Science Ltd.
- Chakalall, B., R. Mahon, and P. McConney 1999. Current Issues in Fisheries Governance in the Caribbean Community (CARICOM). *Marine Policy*, **22**(1):29-44.
- Chuenpagdee, R., J. Fraga and J. I. Euán-Avila. 2004. Progressing towards co management through participatory

- research. *Society and Natural Resources*, **17**: 147-161.
- Fisheries Division. [1994]. Inception report- Project objectives, strategies and activities: FAO/ UNDP project 'Integrated Coastal Fisheries Management'. Trinidad and Tobago Report No.3. Unpubl. Fisheries Division, Ministry of Agriculture, Land and Marine Resources, Port of Spain, Trinidad .31pp
- Fisheries Division. [1996a]. Policy directions for marine fisheries of Trinidad and Tobago in the 1990's (draft). Unpubl. Fisheries Division, Ministry of Agriculture, Land and Marine Resources, Port of Spain, Trinidad. 105pp
- Fisheries Division. [1996b]. Proposal for the establishment and strengthening of fisheries organisations for the purpose of participation in the fisheries management process. Unpubl. CFRAMP Community Awareness and Education Sub-project and Ministry of Agriculture, Land and Marine Resources Port-of-Spain, Trinidad.
- Fisheries Division. [1997]. Report on the committee appointed by the Honourable Minister of Agriculture, Land and Marine Resources Dr. Reeza Mohammed. To review the status of the inshore/coastal fisheries on the north and south coasts of Trinidad and in the Gulf of Paria and to make recommendations for the optimal utilization of these resources taking into considerations the need for conflict resolution and management among resources users. Unpubl Ministry of Agriculture, Land and Marine Resources, Port of Spain, Trinidad. 29pp.
- Fisheries Division. 2000. *1998/1999 Annual report*. Ministry of Agriculture, Land and Marine Resources. Trinidad and Tobago. 36pp.
- Jentoft, S., B.J. McKay, and D.C. Wilson. 1998. Social theory and fisheries co-management. *Marine Policy* **22**:423-436.
- Jentoft, S. 2005. Fisheries co-management as empowerment. *Marine Policy* **29**:1-7.
- Kishore, R. H. Ramsundar, and M. Clarke-Marshall. [2005]. A report of the fishery system of the fishing communities from Ortoire to Guayaguayare, Trinidad. Document prepared for the IDRC under the Community-Based Coastal resource Management Program (Phase II). 260pp.
- Kishore, R, X. Chin, and H. Ramsundar. 2003. Potential impacts of industrial development on coastal fisheries in the Gulf of Paria, Trinidad. *Proceedings of the 54th Annual Gulf and Caribbean Fisheries Institute* 13-27.
- Kuruvilla, S, L. Ferreira, and S.Soomai. 2000. The trawl fishery of Trinidad and Tobago. Fisheries Occasional Paper Series No. 9. Fisheries Division, Ministry of Agriculture, Land and Marine Resources, Port-of-Spain, Trinidad. 18 pp.
- Manickchand-Heileman, S., and D.A.T. Phillip. [1992]. Preliminary stock assessment for the fishpot fishery of Tobago. Technical Report of the Project for the Establishment of Data Collection Systems and Assessment of the Fisheries Resources. Unpubl. Fisheries Division, Ministry of Agriculture, Land and Marine Resources, Port-of-Spain, Trinidad and FAO. 38pp.
- McConney, P., R. Pommeroy, and R Mahon. 2003. *Guidelines for coastal resources co-management in the Caribbean: communicating the concepts and conditions that favour success*. Caribbean Conservation Association in association with the Centre for Resource Management and Environmental Studies (CERMES), University of the West Indies and the Marine Resources Assessment Group Ltd. 55pp.
- Ministry of Energy and Energy Industries (MOEEI). 2005. "Overview". [September 19, 2005]. <<http://www.energy.gov.tt/applicationloader.asp?app=articles&id=807>>
- Soomai, S., N. Ehrhardt, K. Cochrane, and T. Phillip. 1999. Stock assessment of two sciaenid fisheries in the west coast of Trinidad and Tobago. Pages 124-137. In: *Report of the third CFRAMP/FAO/Stock Assessment Workshop on the Shrimp and Groundfish Resources of the Guianas-Brazil Shelf*. Belem, Brazil (25 May – 9 June 1999). FAO Fish Rep, No. 628 FAO:Rome.
- The Fisheries Act Chapter 67:51. Laws of Trinidad and Tobago.

