A DISCUSSION OF SUSTAINABLE DEVELOPMENT OF YEMENI FISHERIES IN THE CONTEXT OF MILLENNIUM DEVELOPMENT GOALS AND STAKEHOLDER ASPIRATION

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ABSTRACT

This paper discusses sustainable development of Yemeni fisheries towards achievement of Millennium Development Goals (MDG) and stakeholder aspiration. Yemen is considered a Least Developed Country ranking 148 among 174 countries in terms of the Human Development Index. In terms of food security, Yemen is classified as a Low-Income and Food Deficit Country and imports over 75% of its main staple, wheat. Out of Yemen's twelve MDG targets, none were identified as probably achievable, two as potentially achievable and seven as unlikely to be achieved. The fisheries sector has been identified as a means of achieving development and effort is rapidly increasing. Under these open access conditions there is a potential threat to the fisheries resources and lack of catch / effort data or status of stocks increases this uncertainty.

Keywords: Yemen, fisheries, development, MDG, poverty, tuna, open access, OAE, artisanal fishing, quality improvement, economics, stakeholder participation, aquaculture

INTRODUCTION

This paper aims to establish the planed development for Yemen's fisheries and identify the main challenges related to sustainable Yemeni fisheries development in the context of achieving MDGs (Millennium Development Goals) and stakeholder aspirations. Preliminary research has been carried out with stakeholders in terms of interviews with fishermen, workers and processing companies. A comparison has been made with reports undertaken by development agencies, consultancies and other sources (WB, FAO, EC, UNDP, MEP etc).

Yemen is considered a Least Developed Country and ranks 151 among 177 (HDR 2005) countries in terms of the Human Development Index (HDI). In terms of food security, Yemen is classified as a Low-Income and Food Deficit Country and imports over 75% of its main staple, wheat (WB 1999). Yemen has a higher HDI ranking than its Gross Domestic Product (GDP) per capita rank (HDR 2005), meaning that on income alone it would rank much further down the list. Compared to the other 'low human development' classified countries Yemen has the highest life expectancy at 60 years (average is 46) but has relatively low adult literacy and education rates (IBID). Development in Yemen is at the top of the political agenda, with the main target being poverty reduction, but it looks unlikely that the MDGs will be achieved (Ahmed 2005).

Fisheries are economically, socially and politically important to Yemen, they directly support almost 500,000 people and contribute 3% to the total GDP (FRM 2005). Fisheries have been identified as a means of contributing further to sustainable development and achieving the MDGs (WB 2005). The government target is to raise the contribution of the fishery sector to 4% the gross domestic production by achieving a 10% annual increase in fishery production to reach to 564 thousand metric tons (MT) by the advent of 2010 (Yemen Times, 2005). Fisheries have been identified as a target of development by government, the World Bank (WB), European Union (EU) and other agencies leading to development plans and strategies to alleviate poverty and promote human development through fisheries development. Despite this, the government 2006-2010 (third five year plan) to target MDGs and in line with the Poverty Reduction Strategy Paper (PRSP), is to achieve 5-7% economic growth, but does not specifically identify fisheries as a means (Hizam, 2006).

In 1998, the latest available data (PRSP 2002), 42% of the population (7 million people) lived below the national poverty line (defined as 3,200 YR per month in 1998, or 23 USD per month). In 2004 the population had grown considerably to 21 million with an annual rise of 3.5%, large families are very popular and the population is estimated to reach 35 million by 2025. The majority of poor (83%) are located in rural areas (PRSP) and there is unequal distribution between governates, some are far poorer than others. Foreign debt has been reduced and is now a manageable 4 billion USD (WB URL).

SUSTAINABLE ECONOMIC AND FISHERIES DEVELOPMENT IN YEMEN

Since Yemeni unification in 1994, there have been various development projects and environmental management plans funded (or part-funded) by external agencies. The WB, National Governments (including EU, UK, France and Germany), IOTC (Indian Ocean Tuna Commission), FAO, IDA, UNDP and others (GEF) have been involved in directing and monitoring development of the Yemeni fisheries, marine and environmental sectors. Foreign Direct Investment (FDI) in fisheries development as well as domestic private investment has been considerable.

Twelve ambitious MDG targets were set for Yemen for completion by 2015, however, the latest progress reports (Anon 2005) states that none were identified as probably achievable, two as potentially achievable and seven as unlikely to be achieved. The PRSP and government five-year development plans for poverty reduction detail the means of achieving these targets and are regularly reviewed. The World Bank led, government implemented fifth fisheries development plan is integrated into MDG and poverty reduction plans and is due to commence later in 2006. The project aims (outlined in WB, 2005) to develop the infrastructure of fisheries and improve the fishery exports, in particular:

- Strengthening fisheries resource management
- Improving fisheries infrastructure and quality
- Cooperative development and income improvement
- Support for follow-up projects

According to the Yemeni government, the fifth fisheries project aims to develop the infrastructure of fisheries and improve the fishery exports according to specifications of the international markets, as well as paying more attention to the current fishery research centres and the establishment of new ones (Yemen Times, 2005). There is apparently a baseline resource study being undertaken by MacAlister Elliott and Partners (May 2006), which will establish the current status of stocks. By the time that this is completed it is hoped that there will continue to be stocks remaining.

However, despite this coordinated action and continued economic growth, reported at 4-7% per annum since the millennium, the PRSP Progress Report, 2005 clearly indicates that MDG targets for Yemen are not being achieved and are unlikely to be accomplished within the allotted timescale (Ahmed, Mohammed, S, 2005). In fact, Yemeni Government (Deputy Prime Minister Mr. Sofan) estimated the rate of Yemeni economic growth at 10% for 2005.

The Yemeni fishery is characterised by some 50,000 reported fishermen in Yemen (2003) working 15,000 to 20,000 vessels, catching an estimated 260,000 MT in 2005, supporting a population of 500,000 dependents (FRM 2005). Another source suggests that workers in the fisheries sector provide for 1.7 million citizens or 8.6 percent of Yemen's population (Al-Batati (2) 2006). 99.5% of total catch is by artisanal fishers and unlike typical artisanal fishing a significant proportion of catch in Yemen is exported. Industrial fishing is currently banned, there is no trawling permitted at all and there is no official MCS (Monitoring Control and Surveillance). Artisanal fishers regulate themselves in that they will harass those

that they see as illegal fishers cutting lines and using intimidation. Quality of artisanal catch is poor having no chilling facilities or preparation onboard, with the resulting loss of value upon sale. Revenues of 5 million USD (World Bank, 2005) were previously taken from licensing industrial fishing and these are attempting to be regained from elsewhere. It is currently illegal to import fish for further processing and this damages the processing and re-export sector through lost revenue, inefficiency etc.

The artisanal vessels are typically split into two categories, those that only fish for a day and those that go on longer trips farther offshore. The day boats (skiffs, qaribs, hooris) are small canoes (see Figure 1) with outboard motors capable of high speed and day trips.

Figure 1: Hadhramouti Hoori Fishing Vessels

Hoori's typically have 4-6 crew using hook and line or nets. When tuna fishing at first light they will target sardines to use as live bait, which they will store in onboard tanks. There is little space onboard and what is available is used to hold fish with a maximum of 500 kilos. The longer trip vessels called sambuqes or dows have on-board engines and larger capacity of several tonnes.

The main commercially exploited species are small to medium sized pelagics (mackerels, sardine), yellowfin tuna, cuttlefish, demersals, shrimp and lobster. The value of exports is estimated to be between $60 and $100m USD for 2005 (adjusted FAO), which is ten times that of 1996. Exports consist of fresh tuna and demersals, frozen whole and frozen loin tuna and cuttlefish, live lobsters and dried sea cucumber and shark fin. The main export markets are Europe, Saudi Arabia, surrounding Arab countries with China becoming increasingly valuable. The government intends to increase the individual share of fish to 51kg and raise fishery exports to 31 percent per year, that is 150 thousand tons, of $500 million worth, by the end of 2010 (Yemen Times, 2005). Official reports indicate that the ideal exploitation of fishery wealth will help raise production without affecting the reserve and assert a better management of quality to score a 6% annual increase in the price of fisheries (Yemen Times, 2005).

Aquaculture development has the potential to significantly increase the value of fisheries production in Yemen and contribute to poverty reduction. The PRSP identifies that aquaculture should be developed through local and foreign investments at the 120 natural coastal sites. However MDG 7 (environmental sustainability) must be considered and the necessary legal framework set in place to avoid damaging aquaculture expansion.

Despite the large number of processing facilities and capacity for adding value, there is very little value added being carried out in Yemen. Without increasing effort or catch, the most effective way of increasing the value of exports would be to add value at the processing stage. To reach the target of

increasing the contribution of fisheries without over-exploiting the resource it is essential to develop value-addition.

Two of the main export fisheries for example, tuna and cuttlefish are exported in whole or semi-processed form. The cuttlefish is exported to China where it is then further processed into value-added. Since production in china is amongst the most efficient globally then value-adding for this market would have to be rigorously planned in order to be feasible.

The effects of fishery development on MDGs in Yemen and vice-versa are unclear. There are no statistics available to monitor or evaluate the effects on income, employment, private investment, effect on fishery, stakeholder opinion and foreign exchange earnings for example. And in the opposite, attempts to develop the fishery have had unclear effects on stocks, efficiency, rent capture and overfishing capacity for example. Hadramout Information Editor - Anwar Ba-Sloom, explained, "In recent years, the governorate grabbed many investment opportunities that have tangible social benefits but monitoring such investments essentially is required," (Al-Batati (1), 2006). Further, the results of changing any of the interdependent factors on the fishery of achievement of MDGs are unclear.

The third Five Year Plan for Fish Wealth Development and Poverty Reduction based on the Millennium Goals represents the fisheries component of the Third Five Year Development Plan (2006 - 2010). Prepared with the assistance of FAO, this plan recognizes the main constraints to the sector's contribution to economic growth to be, amongst others:

- A large and growing artisanal fisheries sector with inadequate port and fish landing
- Infrastructure and with inappropriate conditions
- Modest local fish processing capacity
- A serious lack of data on all aspects of the sector
- A limited capacity to monitor and enforce fish quality control

QUALITY IMPROVEMENT, SUSTAINABILITY & OPEN ACCESS

It is a reality that the sanitary conditions of landing sites in Yemen are akin to those in most developing countries, they lack investment, are insalubrious and do not keep fish cold despite the high ambient temperatures (see Figure 2). There are often no unloading facilities, leaving fish to be dragged or thrown on concrete and inadequate equipment for weighing, transporting and washing clearly reduces the quality of the fish.

Figure 2: Landing Site, Hadhramout

The quality improvement plan (as outlined in WB, 2005) is to provide modern infrastructure, equipment and training so that quality is improved, price rises and economic benefits experienced by stakeholders. But it is unclear what the effects would be of shore-based quality improvement measures in terms of open access and in fact overall product quality since there is no change to the quality of product landed by fishermen. "It is fair to say that much of the fish landed in Indian Ocean ports is of poor quality, badly handled on board and without the use of ice." (Al-Batati (1), 2006).

The Fisheries Resource Management Conservation Project by the Republic of Yemen (2005) states that "the relatively low fish quality standards [are] mainly due to inadequate fish landing infrastructure and basic services to support artisanal fisheries". However the main damage to fish quality happens onboard directly after the fish is caught (especially for tuna) and when it is stored before landing. When temperatures are high in the case of Yemen, fish can remain directly in the sun or in the shade for a whole day before being landed. It is also the case in the World Bank and EC documentation that on-board quality is not stressed as the main cause of poor quality.

Hence, the quality of the landed fish can at best only be maintained by shore-based measures. Any improvement in quality must provide sufficient additional rent to sustain the additional cost of maintaining the investment for the project to be sustainable. But as indicated, the marked improvement in quality brought about by the shore-based quality improvement measures is likely to be low and perhaps not create enough rent to be sustainable.

There is too little knowledge of the fishery to be certain that the shore-based quality improvement (and perhaps other development projects) will achieve their aims and have the desired effects on MDGs. Furthermore, unanticipated results of the developments may have long-term negative effects on MDGs and cancel out the positive effects of the fishery development.

What information there is available on the fishery resource (IOTC, personal communications) indicates that open access to artisanal vessels has led to unsustainable catches and over-exploitation of certain stocks. The Republic of Yemen report (2002) identifies optimal exploitation to increase output assuming that the resource is sufficiently robust to sustain this exploitation. This is perhaps a reason for the open access development of the fishery. Government and fishery organisations appear to have assumed that due to the banning of industrial fishing and there now only artisanal fishermen stocks are less exploited than previously. However, there is no data, information or scientific analysis to confirm this theory and number of instances that contradict this theory:

1. Prices are rising, for example,

   "Spiraling prices have made it impossible for low-income citizens to buy both low and high quality fish. Moreover, it has forced them to buy other types of fish used only for feeding fish. Aid (Sardinella Melanura), which was not so popular in Hadramout before, is now used in dishes since it is the only fish that can be bought via competitive prices." (Al-Batati (1), 2006)

   "Nov 2005, businesses expressed that fish prices registered a rise by 50%". (Al-Batati (2), 2006)

2. Catches are falling, for example,

   "tuna for 04/05 season were 30% lower than the previous year and for the 05/06 season 50% lower than 04/05" (pers com.)

   "resources are probably over-exploited" (WB 2005)

The Head of Hadramout University's Marine Life Department Dr. Abdul Kareem Tahir said in an interview with the Yemen Times newspaper (Al-Batati (1), 2006).

> *"There have been no updated studies conducted to determine Arabian Sea fish stocks, but generally speaking, world fish stocks have been dwindling over the past few years. Fishery companies overexploit the stock."*
>
> *"The solution lies in bringing the extended fishing period to a sustainable level, enforcing the breeding season and enabling young fish to grow."*

3. Effort continues to increase (500 new boats donated by government and subsidies to fishermen)

4. Artisanal fishermen are very effective at catching fish; they communicate with each other, can travel very quickly, go anywhere (up to 50km offshore) and are skilled fishermen.

5. Costs for fishermen are rising (Yemen Times, questionnaires), decreasing profits and limiting effort

6. Sizes of tuna caught are small, immature

Traditional bioeconomic models deriving from Bjorndal and Conrad (1987)[1] explain that open access will tend towards complete profit dissipation in the long run as fishermen enter until no more profit is made (OAE - Open Access Equilibrium). There is also a risk that even though the equilibrium stock may be positive the dynamics may lead to collapse along the way. Open access of Yemeni fisheries is not mentioned in the project preparation document (WB 2005) but is identified in the FAO paper by Hariri (2004) as a cause of over-capacity, habitat destruction and economic inefficiency.

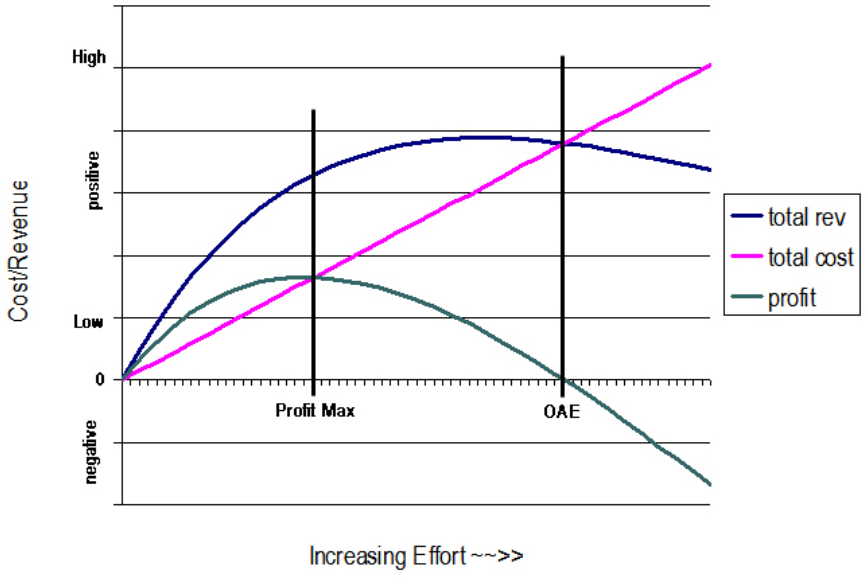

Figure 3: Open Access Equilibrium

[1] Who used it to examine open access conditions on the North Sea herring fishery

As shown in Figure 3 total revenue can be expected to increase as fishing effort expands, but begin to fall after costs rise significantly. Eventually total costs will equal total revenue and zero profit will be made in the fishery. If further effort enters the fishery after this point then negative profit will be made and there will be an eventual tendency towards OAE. To reach maximum profit for the fishery (maximum income) then effort should be reduced to considerably less than OAE.

The basic objectives of fishery development include Maximum Sustainable Yield (MSY), Maximum Economic Yield (MEY) or a combination of multiple objectives decided by social, economic and political factors. Despite having no data, it is still possible to identify the objective, the danger of simply using the term 'sustainable' is that there can be sustainable exploitation at very low levels of catch and high levels of effort. Maximum or optimal sustainable exploitation of the fishery resource is a clearer and more meaningful objective.

The problem of open access is particularly acute for the Yellowfin Tuna (*Thunnus albacares*) fishery, which extends from Al-Mahara on the Oman border right down to Aden. The majority of artisanal fishermen in hoori day boats will use live feed and chase schools of tuna. Catch depends on effort and weather, water temperature, feed availability and other eco-system factors. Estimates of catch have been made by IOTC (Indian Ocean Tuna Commission), private companies and government but as with other date it is not current and unreliable.

Yellowfin tuna is exported in abundance fresh and frozen to high value markets in Europe, North America and Asia. It is also an important source of fresh protein to local communities and is canned in oil for the domestic value-added market. Primary evidence from stakeholders suggests that open access is having the expected effect on the tuna fishery in Yemen in terms of rising prices, falling catches, and continued increased effort.

Stakeholders including processing industry, fishermen and consultant reports have been referred to in the absence of any statistical data for the Yellowfin tuna fishery. The tuna season runs from November to June and Figure 4 shows four seasons from 2002/3 to 2005/6.

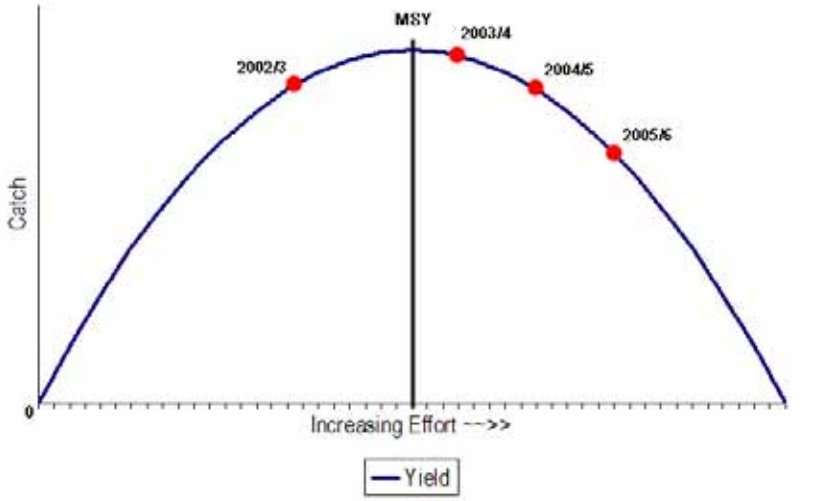

Figure 4: Catch and effort for the Yemeni Yellowfin tuna fishery

This typical catch-effort graph is one explanation of what is being observed in the Yemeni Yellowfin tuna fishery. Since the high catches during the 2002/03 and 2003/04 seasons there has been declining catch

and increasing effort. The 2004/05 season was reportedly 30% less than the previous year and for the recently finished 2005/06 season 30%-50% less again. Perhaps the highly migratory nature of this large pelagic, has meant that they have simply moved elsewhere and that there will be a bumper season next year in 2006/07. But if effort continues to increase and catches remain low next year then overfishing will have become more of a problem.

Fishing vessels are the key to ensuring quality, consistency and efficiency of catch, whilst also improving safety at sea, quality of life for fishermen, ensuring and increasing income. WB 2005 identifies vessel redesign as the final paragraph of the fifth fisheries project objective and in more detail in the Research and Development phase (World Bank 2005, p25).

Attempts were made to encourage fishermen to use ice at sea, at the Yemeni Fish company for example, great emphasis was placed on quality throughout the supply chain. Fishermen were given economic / social incentives, equipment including ice-boxes for their vessels, facilities such as clean landing site and ice and training so that the quality of landed fish was improved. In the case of tunas, a higher price was achieved for export through quality assurance but the price differential (in addition to the other incentives) was not sufficient to ensure uptake by fishermen.

The 'mothership' has been considered[2] and in some cases put into practice but is not technically permitted in legislation (fish should not be transferred between vessels at sea). It is a poor solution to the problem of insufficient artisanal vessels.

Being rational individuals fishermen are not interested in preserving their catch and risking their lives in the process (by making their small vessel unstable) to increase the quality for such small increments in price. Therefore they prefer not to take ice out to sea (even if it is provided for free), bleed tuna (they also have no space) or semi-process (like gutting) on board. Perhaps when the catches reach such a low quantity the fishermen would be forced to increase the value of their fish.

SOCIETAL GOALS AND ASPIRATIONS

Societal goals and aspirations comprise retention of traditional values including religious, opportunities to improve social conditions and increase income (preliminary questionnaires, 2006). There is concern that stakeholders may be passive in voicing opinion as FDI is seen as free money, women are not consulted and other societal characteristics mean many will not make themselves heard. A participatory approach to the sustainable development through FDI of the fishery is being adopted through fisherman's co-operatives and community consultation.

The post-harvest industry would like to see it obligatory for fishermen to carry ice on-board, perhaps through legislation. If enforced, this would have profound effects on the harvest sector and this unknown is perhaps the reason for it not being implemented. Providing support to fishermen under such a requirement would be necessary and the main fisheries development factors expressed by the fishermen include (questionnaire 2006):

1. Stop random fishing by vessels and superboats
2. Reduce fuel price and the other fishing equipment
3. Building a harbour for local fishermen that suffer from bad weather during the period June to September
4. Arrange times and places for fishing for every kind of fish

[2] The concept of having a larger 'mothership' collection vessel that smaller vessels could transfer fish to at sea immediately after capture where it could be better cared for.

5. Prevent any catching of any kind of fish during breeding season for the same species

Fishermen were consulted in brief interviews (interviews carried out in 2006), in terms of overall objective the results showed that the following were most important:

- Liking their job
- Earning more money
- Having more leisure time
- Retaining traditions: fishing techniques, religious festivals and family values
- Education
- Getting a good job with prospects

Al-Hariri (2004) carried out focus group discussions with fishermen in Al-Mukha (Red Sea) to identify local fisheries related problems:

- NFCM takes 3% from auctions, without giving assistance in return
- Interest on loans are too high and do not account for fishing seasonality
- Insurance is expensive, confusing and there is a lack of understanding of the benefits
- Local development issues having an impact on fishing

It is clear that there are diverse expectations of development but the overall aims of increased income, standard of living and job satisfaction in the context of traditional (cultural), religious and family values. Household surveys are already being undertaken (Household Budget Surveys - HBS) by PRSP (2002), but they are irregular and inaccurate.

Not discussing the issues with fishermen directly creates a danger of missing out on key issues. The situation in Yemen is extremely complex and the operation on the ground must be considered, if systems were brought in without this knowledge then there would be a danger that they would be impractical and unworkable. Ahmed Bukari, a local fisherman, “Although fishermen are society’s fish producers, no one pays attention to them,” (Al-Batati, 2006). Any ‘fishery development’ must be clear to those that are involved in the day-to-day activities (parts of the stakeholders) and workable.

For example, it is currently not permitted to import fish for processing and re-export. This keeps prices high, leaves the factory empty at times, reduces competitiveness, and limits employment potential in the private sector. The export industry would benefit from such fishery development, pressure on local fisheries supplies would reduce and there would be a positive effect on poverty reduction. Further fishery development that would benefit the industry would include legislation to force fishermen to take ice to sea and regular, consistent supplies of fish.

SUMMARY

Yemen suffers from extreme poverty, under-development and has valuable marine fisheries resources. There is a coordinated effort to develop the fishery and contribute towards achievement of the MDGs and poverty reduction. However, preliminary reports have indicated that Yemen is unlikely to achieve its MDGs within the timescale.

There are major challenges to developing Yemeni fisheries to achieve MDGs in the context of uncertainty, stakeholder goals and sustainability. There are no reliable statistics on catch, effort or stocks to establish specific management targets. Current conditions seem to be implying rising effort, falling catches (some species) and rising prices. There appears to be a reduction in food security as a result of

increased fishery development and no evidence of increased incomes. Without addressing open access, there will be a tendency towards OAE, rent dissipation and low sustainable yield, perhaps even stock collapse in some cases.

The fifth development plan 2006-2010 is participatory for the stakeholder groups, focussing on shore-based infrastructure to increase quality, data collection and improvement in MCS. It considers MDGs and has undergone a significant period of consultation. However, since uncertainties are so apparent it is in danger of further contributing to open access equilibrium and not sufficiently addressing the goals and values of stakeholders. Since there is no current fisheries data and the public development projects are likely to be slow in starting, there is a further issue that the plan becomes ineffective in achieving its aims.

A legal regulation that requires fishermen to take ice to sea, for example, would dramatically improve quality and reduce fishing effort, alternatively there could be investment in new boat design and proliferation. It is unclear whether the fishermen are in favour of such a development since they enjoy their current method of fishing. However, new vessels would improve safety at sea, regularity of landings and efficiency, not to mention making life easier for fishermen through a degree of automation.

REFERENCES

Ahmed, Mohammed, S, 2005, MDG progress report, Deputy Prime Minister of Planning and International Cooperation. (Yemen).

Anon 2005, *Poverty Reduction Strategy Progress Report for 2003-2004*. June 2005. Accessed from: ULR http://www.yemen-prsp.org/site/publish/en_various_reports.html.

Anon, 2005, *Fisheries Resource Management and Conservation*, Project Information Document (Appraisal Stage) (PID, 2005). Report No.: AB1652., Nov 2005.

Bjorndal, Trond and Conrad, Jon M. The Dynamics of an Open Access Fishery. Canadian Journal of Economics, Vol. 20, No. 1 (Feb., 1987).

EC: European Commission Financing Proposal (ECFP), 2005, ref. 19.08.06

Hariri, Khaled I. and Bonfiglioli, Anglelo, 2004, *Small-scale fisheries in Yemen - Social Assessment and Development Prospects*, December 2004.

Herrera, Miguel and Lepere, Lucia, 2005, Revised catch estimates for tuna and tuna-like species caught by artisanal boats in Yemen. *Indian Ocean Tuna Commission (IOTC)*, IOTC-2005-WPTT-04.

Hizam, Adnan, 2006, PM Suggests New View for Economic Growth, *Yemen Observer*, May 28, 2006

International Monetary Fund and International Development Association Republic of Yemen, (IMF and IDA) 2002, *Joint Staff Assessment of the Poverty Reduction Strategy Paper*, July 15 2002.

Medley, Paul. A, Participatory Fishery Stock Assessment, *MRAG Ltd*, November 2003.

Misund, Ole, A. 2006, Ecosystem based management: definitions and international principles, *Institute of Marine Research*, Bergen, Norway, Feb 2006.

PARIS21, 2006, Task Team on Improving Support for Monitoring Development Goals. Country Case Study YEMEN, *PARtnerships In Statistics in the 21st Century*, Accessed from: URL: http://www.paris21.org.

Questionnaire, 2006. Undertaken though participation with stakeholders. Personal communications.

Republic of Yemen, 2002, *Poverty Reduction Strategy Paper (PRSP)*, 2003-05. May 2002. (Translated)

Republic of Yemen, 2005, *Fisheries Resource Management and Conservation Project, Environmental Management Plan*, E1197, May 2005.

Al-Batati, Saeed (1) 2006, Skyrocketing fish prices in Hadramout, *Yemen Times*, March 2006, Accessed from ULR: http://www.yementimes.com/article.shtml?i=927&p=business&a=1.

Al-Batati, Saeed (2) 2006, Yemeni Fish Company general manager: excellent management will ensure Yemeni fisheries' long life, *Yemen Times*, April 2006, Accesed from URL: http://www.yementimes.com/article.shtml?i=938&p=health&a=1.

Santos, Rui et al, 2005, Stakeholder participation in the design of environmental policy mixes. *Ecological Economics*, Nov 2005.

UNDP, 2005, *Human Development Report (HDR) 2005*. Accesed from: URL http://www.nhdr.org/site/publish/article_63.html. 2005-10-16.

United Nations Development Programme, 2005, A time for Bold Ambition, *Annual Report 2005*.

World Bank, 1999, *Fisheries Sector Strategy Note.*

World Bank, 2005, *Fisheries Resources Management and Conservation Project* , Project Appraisal Document. Report No: 33015-YE., Team Leader: Trayambkeshwar P. N. Sinha, Nov 28 2005.

Yemen Times, 2005, WB funds fifth fishery project, *Yemen Times*, July 2005, Accessed from URL: http://www.yementimes.com/article.shtml?i=861&p=business&a=1.

Yemeni Ministry of Fish Wealth, 2006, Draft Law No (1) of 2006. Concerning Organization of catching, utilizing and protecting marine creatures.

ANNEX 1: MILLENNIUM DEVELOPMENT GOALS (MDGS) AND SPECIFIC YEMENI TARGETS TO BE ACHIEVED BY 2015

MDG1: Eradicate extreme poverty and hunger

Target 1 - **Halve the proportion of people living below the national poverty line**

Target 2 - **Halve the proportion of underweight, under-five year olds**

MDG2: Achieve universal primary education

Target 3 - **Achieve universal primary education**

MDG3: Promote gender equality and empower women

Target 4 - **Achieve equal access for boys and girls to primary and secondary schooling (2005)**

MDG4: Reduce child mortality

Target 5 - **Reduce under-five mortality by two-thirds by**

MDG5: Improve maternal health

Target 6 - **Reduce maternal mortality ratio by three-quarters**

MDG6: Combat HIV/AIDS, malaria and other diseases

Target 7 - **Halt and reverse the spread of HIV/AIDS**

Target 8 - **Halt and begin reverse on malaria and other major diseases**

MDG7: Ensure environmental sustainability

Target 9 - **Reverse loss of environmental resources**

Target 10 - **Halve the proportion of people without access to safe drinking water**

MDG8: Develop a global partnership for development

Target 11 - **Develop and open trading and financial system**

Target 12 - **Deal with debt problems and ensure sustainability**