Fisheries Opportunities Assessment

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Prepared By:

Sustainable Coastal Communities and Ecosystems Program (SUCCESS) and Global Water for Sustainability Program (GLOWS)

IMCAFS INTEGRATED MANAGEMENT OF COASTAL AND FRESHWATER SYSTEMS

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Left: Filipino fisher mending nets (Alan White)
Center: Ecuadorian woman cleaning fish (Patrick Christie)
Right: Fishing boats, Indonesia; (Robert Pomeroy)

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Components of the Integrated Management of Coastal and Freshwater Systems Program (IMCAFS)

List of Acronyms

ABCI	Amazon Basin Conservation Initiative
ADB	Asian Development Bank
ALLFISH	Alliance for Responsible Fisheries
ASEAN	Association of South East Asian Nations
BRD	By-catch Reduction Device
CARICOM	Caribbean Community and Common Market
CARPE	Central Africa Regional Program for the Environment
CAWT	Coalition Against Wildlife Trafficking
CECAF	Fishery Committee for the Eastern Central Atlantic
CI	Conservation International
CLIFFS	Congo Livelihood and Food Security Project
COBI	Comunidad y Biodiversidad
COMPASS	Community Partnership for Sustainable Resource Mgt. in Malawi
CRMP	Coastal Resource Management Program
CREDP	Congo River Environment and Development Project
DFID	United Kingdom's Department for International Development
DOI	Department of the Interior
DOS	Department of State
DR-CAFTA	Dominican Republic-Central American Free Trade Agreement
EEZ	Exclusive Economic Zone
EGAT	USAID Bureau for Economic Growth, Agriculture, and Trade
EU	European Union
FAO	Food and Agriculture Organization
FISH	Fisheries Improved for Sustainable Harvest
GDA	Global Development Alliance
GEF	Global Environment Facility
GEM	Growth with Equity Program
GLOWS	Global Water for Sustainability Program
GPS	Global Positioning System
HACCP	Hazard Analysis and Critical Control Point
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
IBAMA	Brazilian Environmental Agency
ICM	Integrated Coastal Management
ICMRD	International Center for Marine Resource Development
ICRAN	International Coral Reef Action Network
IDRC	International Development Research Centre
IEHA	Initiative to End Hunger in Africa
IMCAFS	Integrated Management of Coastal and Freshwater Systems Program
IMPA	Indo-Malay-Philippines Archipelago
IPOA	International Plan of Action on Overcapacity
IPOPCORM	Integrated Population and Coastal Management Program
ITQ	Individual Transferable Quota
IUCN	World Conservation Union

IUU	Illegal, Unregulated and Unreported [Fishing]
IWRM	Integrated Water and Coastal Resources Management
LAC	Latin America and the Caribbean
LMMA	Locally Managed Marine Area
LME	Large Marine Ecosystems
MACH	Management of Aquatic Ecosystems through Community Husbandry
MCC	Millennium Challenge Corporation
MDG	Millennium Development Goal
MER	Marine Extractive Reserve
MPA	Marine Protected Area
MSC	Marine Stewardship Council
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration
NORAD	Norwegian Agency for Development Co-operation
PRC	Peoples Republic of China
PROARCA	Programa Ambiental Regional para Centroamérica
PROFISH	Global Program in Fisheries
RCSA	The USAID Regional Center for Southern Africa
RMO	Resources Management Organization
RUG	Resource User Groups
SEAP	Special Secretariat for Fisheries and Aquaculture
SLA	Sustainable Livelihoods Approach
SUCCESS	Sustainable Coastal Communities and Ecosystems Program
TED	Turtle Excluder Device
TNC	The Nature Conservancy
URI	University of Rhode Island
USAID	United States Agency for International Development
USG	United States Government
WRI	World Resources Institute
WTO	World Trade Organization
WWF	World Wildlife Fund
ZIMOZA	Zimbabwe, Mozambique, Zambia Transboundary Area

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EXECUTIVE SUMMARY

The Context

Marine, coastal and freshwater ecosystems have been drastically altered over the past 50 years, reducing their productivity, resilience and potential for the future. Fishing is the largest extractive use of wildlife in the world. Fisheries products are the world's most widely traded foods, with commerce dominated by the developing countries (total value of world fishery production in 1999 was US $125 billion). Fisheries are also globally important sources of much needed high quality animal protein—the primary protein source for some 950 million people worldwide, and an important part of the diet of many more. Fishing and the sale of fisheries products provide invaluable employment and cash income, create local economies and generate foreign exchange. Marine and freshwater fish are also an increasingly important recreational resource.

The Problem

In spite of the important role that fisheries play in the national and local economies of many transformational and fragile states, the fisheries sector—as compared against other sectors of the world food economy—is poorly planned and regulated, inadequately funded, and neglected by all levels of government. Fisheries around the globe are frequently overfished and overexploited as a result of not only weak governance, but of poor management, perverse subsidies, corruption, unrestricted access and destructive fishing practices. Therefore, reforming both the governance and the management of these critical natural resources is essential to stable and long-term economic development, continuation of the ecosystem goods and services provided by these natural resources, the conservation of biodiversity and in some cases may be essential to overall peace and security.

This Report

In light of the above context for the capture fisheries sector, the United States Agency for International Development (USAID) commissioned this report to identify and recommend opportunities for *Improving Management of Fisheries to Enhance Conservation, Ecosystem Health and Productivity.* The report provides information on why small-scale fisheries are important and on the relationship of small-scale fisheries to biodiversity conservation. It also describes issues affecting the sustainability of fisheries and its associated threats to biodiversity. It includes a review of past and current activities of both USAID and others to identify strategic opportunities for which USAID may hold a competitive advantage. The final component of the assessment report offers specific recommendations for action at global, regional, and national levels. Below are key findings and a summary of specific recommendations covered in further detail.

The Opportunity

USAID has a strategic opportunity to promote more sustainable fisheries management based on its longstanding experience, leadership role and comparative advantage in land tenure reform, coastal governance and natural resources management. The Agency can assist in addressing several of the key issues plaguing small-scale fisheries management in developing countries—issues such as weak governance, excess fishing capacity, illegal fishing, poverty and livelihoods, and unsustainable globalization of trade and market access. Many of these issues were highlighted in the October 3, 2006 Presidential Memorandum calling for the Secretary of State and the Secretary of Commerce to work with other countries as well as regional and international organizations to promote sustainable fisheries and end destructive fishing practices (see Appendix 1).
Past failure to address these issues has had significant social consequences, has led to economic losses for millions of people living in fishing communities, and is severely impacting associated ecosystem resilience and biodiversity. These problems will only worsen if national governments and international donors continue to give low priority to capture fisheries issues. While often politically difficult, there is a growing suite of proven strategies that provide opportunities for significant reform that can generate real and tangible social and economic benefits. These include:

- strengthening fisheries governance through use of co-management, adaptive management, marine tenure, integrated coastal management and ecosystem-based management approaches,
- increasing integration of fisheries management with marine protected areas and use of fisheries reserves,
- reducing excess fishing capacity, controlling access and preventing illegal fishing,
- building political will at the national and local levels for capture fisheries reform,
- improving fisheries information for better decision-making, especially for the small-scale fishery sector,
- alleviating poverty in fishing households by diversifying livelihoods and through integrated livelihood approaches, and
- promoting fair and sustainable international seafood trade and market access.

Net fisheries exports from developing countries in 2002 was worth US $17.4 billion

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77% of world fisheries production is from developing countries

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For 2.6 billion people, fish represents more than 20% of the animal protein in their diet

***

50 million men and women are directly employed in small-scale fisheries

***

96% of fishers worldwide are small-scale and provide 50% of global catch, and most reside in developing countries

Why USAID Should Care

Each of the above mentioned strategies has clear linkages to the United States (U.S.) government's Foreign Assistance Framework and the framework's key objectives—Peace and Security, Governing Justly and Democratically, Investing in People, Economic

Growth, and Humanitarian Assistance. The U.S. should invest in improved capture fisheries management for many reasons.

It is increasingly apparent that failed fisheries management contributes to poverty and food insecurity. Participatory and gender equitable fisheries management is fundamental to success and sustainable policies. Human resources and technical capacity underpin all successful fisheries management efforts, yet are lacking in many contexts. Sustainable fisheries management will result in economic growth that provides jobs and food, and preserves cultural values over the long-term. Finally, sustainable fisheries management will reduce humanitarian crises and provide opportunities for those nations emerging from conflict and poverty.

The declining state of fisheries resources—a state readily acknowledged today—will have disproportionately heavy consequences for developing countries and their poorest communities and members.

USAID in partnership with national governments, nongovernmental organizations (NGOs) and other donors, as well as other U.S. government agencies, can continue to play an important and essential role in helping build and sustain more democratic, well-governed freshwater and marine fisheries management systems that responsively address critical needs of thousands of fishing communities in an environmentally sustainable manner.

The Goal

USAID should make a strong organizational commitment to attack several critical issues for fisheries management at this time. In particular, USAID should focus its attention on (1) strengthening governance, and (2) reducing excess fishing capacity, with the ***main goal to achieve economically and politically secure fishing communities by building and strengthening sustainable fisheries resources management systems.*** The emphasis should be on small-scale fisheries—the sector upon which the majority of the world's millions of fishers and their families depend (small-scale fisheries communities are generally poor and vulnerable communities that rely on the resource for both food and income), while also the fisheries sub-sector that is most neglected by fisheries assistance and development programs in the past. While the small-scale fisheries sector should be the priority, assistance to the large-scale sector may be justified in instances where that industry impacts the small-scale sector or in regards to international trade of seafood products.

Rationale for Action

If managed more effectively, capture fisheries can provide an economic development dividend to numerous countries around the world. Better management can also avoid the continuing collapse of aquatic and marine ecosystems and associated biodiversity occurring throughout the world's oceans and aquatic environments. Provided below are specific recommendations for addressing key issues and threats as described in this report. These recommendations focus on those opportunities where USAID could capitalize on its comparative advantage. While these recommendations focus on the

suggested priority opportunities and strategies for strengthening governance and reducing excess capacity in the fisheries sector, most efforts will require an integrated approach—one that to varying degrees draws on most, if not all, of the approaches described in the opportunities section of this report. A summary of the recommendations for action at the global, regional, and national scales follows.

Summary Recommendations

Global recommendations are targeted at activities that can be led or coordinated by USAID/Washington, with the intent of demonstrating US and USAID international and technical leadership.

Global

- Build the capacity of USAID staff in Missions and Regional Bureaus to engage in sustainable capture fisheries programs through USAID/EGAT(Office of Environment and Natural Resources Bureau for Economic Growth, Agriculture, and Trade)-led workshops that support priority setting and strategic planning by Missions and Bureaus.
- Promote public-private sector alliances in capture fisheries by expanding the USAID Global Development Alliance (GDA) portfolio, with a focus on sustainable seafood and fair trade; parallel the public-private alliances already underway for sustainable forest products and illegal logging.
- Include wild fisheries management under sustainable agricultural approaches within the Food for Peace Program and the Chronic Food Insecurity Countries, similar to the successful program in Bangladesh.
- Ensure that capture fisheries management and responsible use of generated revenues from seafood are included under the Extractive Industries Initiative.
- Address labor and environmental compliance issues associated with capture fisheries under future and present Free Trade Agreements, such as the Dominican Republic and Central American Free Trade Agreement (DR-CAFTA).
- Build trade capacity in developing countries for negotiating equitable and appropriate access agreements.
- Expand integrated population-environment programs with a focus on fishing communities, such as the successful Integrated Population and Coastal Management (IPOPCORM) program.
- Capitalize on the expertise and capacity-building experience within the U.S. university community on wild fisheries management: provide core funding through the Collaborative Research and Support Program for capture fisheries, and establish training opportunities for fisheries managers in developing countries.
- Disseminate lessons learned from past and ongoing programs and establish regional learning networks.
- Provide international leadership among donors, other U.S. government agencies and NGOs and promote greater attention to sustainable fisheries management.

- Coordinate with key donors and international institutions by raising awareness of the importance of reforming small-scale fisheries management for sound economic and environmental development and for meeting the Millennium Development Goals.
- Create stronger linkages between fisheries and the U.S.-led Coalition Against Wildlife Trafficking (CAWT), focusing on illegal and destructive fishing practices such as cyanide use.
- Exercise U.S. leadership and make operational the October 2006 Presidential Memorandum on sustainable fisheries (see Appendix 1) by establishing a high level (Presidential) initiative on sustainable fisheries that raises the importance of sustainable fisheries management at the international level.

Regional

Africa-wide: Reduce the incidence and impacts of HIV/AIDS in the fisheries sector through education, knowledge exchanges, and aquaculture options for households affected by HIV/AIDS and malnutrition. In addition, build capture fisheries and aquaculture activities into the *Initiative to End Hunger in Africa* (IEHA).

***African Rift Lakes*:** Establish an integrated, ecosystem-wide transboundary ecosystem-based approach to fisheries management.

Congo Basin: Develop sustainable fisheries initiatives that are integrated with democracy and governance in support of sustainable livelihoods, building upon past USAID efforts.

Amazon Basin: Improve freshwater fisheries management through the establishment of protected area networks.

South East Asia Region: Reduce regional overfishing, illegal fishing and illegal fish trading in the region. Ensure that the regional wildlife trade program addresses marine life and illegal fishing.

Meso-American Region: Build upon the sustainable fisheries efforts supported by USAID under the Meso-American Reef Alliance program, and expand public-private partnerships.

National

Across all regions, provide technical assistance for national level assessments to more fully understand the small-scale capture fisheries issues and impacts on ecosystems and local economies. Below are other national-level recommendations clustered by region.

<u>Latin America and Caribbean</u>

Brazil: Improve information for decision-making for marine extractive reserves.

Haiti: Improve fisheries governance and food security through an integrated livelihoods approach.

Honduras and Nicaragua: Promote fair and sustainable international trade of lobster and conch fishery resources through private-public sector alliances.

Jamaica: Improve fisheries governance through co-management, effort reduction, and increased use of fisheries reserves.

Mexico: Strengthen governance through ecosystem-based management of the Sea of Cortez fisheries.

Africa

Democratic Republic of Congo: Improve economic development and food security through sustainable livelihoods and fisheries management to meet basic needs in a post-war society.

Guinea (Conakry): Reduce excess capacity and strengthen national capacity to promote better international foreign fishing agreements and fisheries trade.

Liberia: Improve economic development and food security through sustainable livelihoods and fisheries management to meet basic needs in a post-war society.

Malawi: Improve fisheries governance through participatory fisheries management, ecosystem management and increased use fish sanctuaries.

Mali: Promote sustainable fisheries and fisheries-related livelihoods in the Inner Delta of the River Niger, Mali.

Mozambique: Improve fisheries governance through co-management including assistance with the development of coastal zonation schemes and marine protected areas.

Namibia/Zambia: Transboundary freshwater fisheries management for river and lake systems.

Senegal: Establish sustainable fisheries management, reduction of inter-African nation poaching and open access, and gender-sensitive economic development.

Asia

Bangladesh: Promote community-based management and livelihood development by establishing integrated water and fisheries management programs; build upon and expand the successful Management of Aquatic Ecosystems through Community Husbandry (MACH) and Food for Peace Programs, and share the MACH experience with other Missions in the region.

Indonesia: Develop decentralized governance capacity for fisheries co-management through technical assistance to the national and local governments and the establishment of sustainable fisheries management in critical areas. Build upon the national government's commitment to establish effective networks of fishery reserves, as well as past USAID support to national and decentralized coastal governance.

Philippines: Scale-up management, reduce fishing effort, raise awareness among the public and key policy makers of the need for effort reduction, and promote regional networking. Build upon the successful USAID-supported Fisheries Improved for

Sustainable Harvest (FISH) program, and share the FISH experience with other Missions in the region.

Vietnam: Reduce excess fishing capacity by supporting the national government's recent policy commitment to effort reduction.

1. Introduction

The purpose of this assessment is to identify and recommend opportunities to USAID for ***Improving Management of Fisheries to Enhance Conservation, Ecosystem Health and Productivity***. The report provides information on why small-scale fisheries are important and the relationship of small-scale fisheries to biodiversity conservation. Issues affecting the sustainability of fisheries and associated threats to biodiversity are described. A review of current activities by USAID and others is included to identify strategic opportunities for which USAID may hold the competitive advantage. The final component of the assessment report offers specific recommendations for action at national, regional, and global levels.

The following factors are driving the current USAID interest in fisheries.

- Overfishing, overexploitation and destructive fishing practices are among the greatest threats to marine and freshwater biodiversity.
- Fisheries are locally, nationally, regionally and globally important as a source of food, income, and trade—yet, they face substantial and growing threats.
- Well-managed fisheries resources provide substantial opportunity for improving livelihoods of both men and women, preventing poverty, and contributing to national economies and foreign exchange.
- While USAID is already committed to investing in sustainable forestry activities (Sustainable Forests Products Global Alliance, Presidential Initiative against Illegal Logging) and other extractive industries, fisheries remain underrepresented.
- A sustainable fisheries focus builds upon previous USAID bilateral and global investments in coastal and marine management and would allow the Agency to exchange its rich experiences in coastal governance and conservation among regions.
- A sustainable fisheries focus fits USAID's institutional profile and is harmonious with recent Agency investments in democracy and rule of law, anti-corruption, economic growth and trade, poverty prevention and poverty reduction, gender equality, developing and transformational states, and public-private partnerships.

In response to increasing threats to marine and coastal ecosystems, both the international community and the U.S. Government have called for increased actions and interventions, including but not limited to:

- The U.S. Government (USG) has committed to the Millennium Development Goals and the Johannesburg Plan of Implementation. The Millennium Development Goals call for reducing poverty and hunger while "integrating the principles of sustainable development into country policies and programs and reversing the loss of environmental resources" such as fishing—which is often the last social safety net for poor households in fishing communities.
- At the 2002 World Summit on Sustainable Development, participants agreed to restore depleted fish stocks by 2015, recognizing that oceans are essential ecosystems and a critical food source, especially in poor countries. The Implementation Plan highlighted the need to "Develop and facilitate the use of diverse approaches and

tools, including the ecosystem approach, the elimination of destructive fishing practices, and the establishment of marine protected areas consistent with international law and based on scientific information, including representative networks by 2012." At the World Parks Congress in 2004, recommendations included the creation of a network of functional marine protected areas to restore fisheries productivity and protect marine biodiversity.

- In 2003, the U.S. Congress called for the creation of an independent commission to review U.S. domestic and international ocean policy. Both the U.S. Commission on Ocean Policy Report and the Administration's response call for the U.S. to increase international leadership by promoting enhanced coastal governance to protect and conserve coastal and marine resources—from coastal watersheds and wetlands to marine fisheries and coral reefs. In addition, the President's Executive Order on Coral Reef Protection established the U.S. Coral Reef Task Force, committed to coral reef biodiversity and conservation and promoting sustainable fisheries management.
- On October 3, 2006 President George W. Bush signed a presidential memorandum calling for the Secretary of State and the Secretary of Commerce to work with other countries as well as regional and international organizations to promote sustainable fisheries and end destructive fishing practices.[1]

This assessment report relied on background research and consultations with a wide range of stakeholders including relevant USAID operating units and U.S. government agencies (e.g., the U.S. Department of State, the National Oceanic and Atmospheric Administration/NOAA, and the Department of Interior/DOI); non-governmental organizations (NGOs); and the international donor community. It also drew from the report teams several decades of collective global experience in fisheries management and research. It is worthwhile to note some of the limitations to a desktop study, such as this report. First, it is often difficult to place information in context—especially if that context is one of rapid change. Further, there are specific challenges for a report on the topic of small-scale, tropical fisheries. Much of the existing cache of research and reporting on this topic is dated, seldom peer-reviewed, and frequently difficult to access. In addition, while there is growing consensus on the key problems within small-scale capture fisheries management, little is known about some basic aspects of these types of fisheries and fishing communities. A final challenge in developing this report was the fact that some informants simply did not respond to requests for information. Staffs are frequently overextended and lack ready access to relevant information. Nonetheless, this assessment is based on dozens of interviews, email exchanges, feedback to an oral presentation at the Woodrow Wilson Center in Washington DC, and written comments on drafts.

In spite of recognized limitations of a report of this type and size, the report confirms the growing interest and awareness in recent years of the importance of managing fisheries resources and conserving biodiversity. More importantly, it identifies significant opportunities for the development community—with USAID playing an important role—to move beyond awareness and interest and take concrete actions to help "turn around" the "small-scale capture fisheries-in-decline" scenario facing the world today.

[1] http://www.whitehouse.gov/news/releases/2006/10/20061003.html#

2. Why Should USAID and its Partners Care about Small-Scale Fisheries?

Increasing evidence indicates that marine, coastal and freshwater ecosystems have been drastically altered over the past 50 years, reducing their productivity, resilience and potential for the future. Fishing is the largest extractive use of wildlife in the world and fisheries products are the world's most widely traded foods, with commerce dominated by the developing countries. The total value of world fishery production in 1999 was US $125 billion. Fisheries are also globally important sources of much needed high quality animal protein—the primary protein source for some 950 million people worldwide, and an important part of the diet of many more. Fishing and the sale of fisheries products provide invaluable employment, cash income, create local economies and generate foreign exchange. Marine and freshwater fish are also an increasingly important recreational resource, both for active users such as anglers and passive users such as tourists, sports divers and nature-lovers.

In spite of the important role that fisheries play in the national and local economies of many rebuilding, developing and transforming states, the fisheries sector—as compared against other sectors of the world food economy—is poorly planned and regulated, inadequately funded, and neglected by all levels of government. Weak governance is not the sole factor that has led to fisheries around the globe being overfished and overexploited. Rather, this situation is also the result of poor management, perverse subsidies, corruption, unrestricted access and destructive fishing practices. Therefore, reforming both the governance and the management of these critical natural resources is essential to creating stable and long-term economic development, continuing the delivery of ecosystem goods and services provided by these rich resources, conserving biodiversity, and in some cases maintaining peace and security.

2.1 Importance of Fisheries

As noted above, fisheries have major value as a source of food and income. Worldwide, fish (defined in this report as all living aquatic resources) are a critical source of animal protein, healthy lipids, and essential micronutrients. For 2.6 billion people in developing countries, fish provide more than 20% of animal protein consumed, compared to 8% in industrialized countries. In some developing countries, fish actually provides up to 50% of the animal protein consumed. Fisheries also provide an important source of livelihood and income for 1.5 billion men, women and children.

Global fish production was estimated at 133 million tons in 2002**.**[2] Capture fisheries accounted for 93 million tons (70%) and aquaculture for 40 million tons (30%). From 1970 to 2002, aquaculture's contribution to global supplies of finfish, crustaceans, and mollusks for human consumption increased from 3.9% to 29.9%, representing an average annual growth rate of 8.9% (this compares to 2.8% for production of meat from farmed livestock). Inland fisheries harvests contribute 10% of global fish production and have grown at a slower pace of about 1% per year.

[2] most recent available data from the Food and Agriculture Organization (FAO)

It is important to note two realities of the aquaculture sector. While aquaculture has expanded, diversified and intensified in response to the increasing gap between fish supply and growing demand, aquaculture's heavy dependence on intensive systems of inputs—water, energy, chemicals—and on wild fish for feed and seed, are major constraints to the sustainability and future growth of this industry. As well, aquaculture can negatively impact ecosystem health, the health of specific species and the health of women and men workers.

Overall, developing countries had a higher share of global fish production (77%) than did developed countries. Fish are the most heavily traded food commodity and the fastest growing "agricultural" commodity on international markets. While women often play a significant role in fish trading for local and sub-national markets, as well as small-scale cross-border trade, men more often dominate national and international-level fish trade. The supply-demand relationship is from the "south" to the "north"—i.e., from developing to developed countries. This has maintained incentives for investment in fishing vessels despite stable or falling overall catches. In 2002, net exports amounted to US $17.4 billion in foreign exchange earnings for developing countries, a value greater than the combined net exports of rice, coffee, sugar, and tea.

Rapidly growing demand for fish, fuelled by population and income growth and health concerns, has increased fish prices. This is a many-edged sword. It may create a short-term *economic advantage* for the small-scale fisher, whereby the growing demand but declining supply leads to increased selling prices (at least temporarily), which in turn may drive the fisher to increase his/her fishing effort in order to generate more individual income. However, it can work in reverse as well—i.e., by increasing the incentive for others to enter into fishing activities, further crowding the field and providing less yield per fisher such that even at higher selling prices per fish or per kilo, the net income is less for the individual. At the same time, this situation creates a longer-term *ecological disadvantage*—one where overfishing and overcapacity to fish puts increasing pressure on already highly stressed fish stocks and associated ecosystems. This in turn creates another "edge" to the sword—one with a serious *health impact*, as the poorest fishing communities become "priced out" of providing an important source of animal protein for their families' diets.

2.2 Small-Scale Fisheries: How Do We Define It? Who Does It?

"Capture fisheries" involves the harvesting, processing, and trading of wild fish and other aquatic organisms in fresh-, brackish- and seawaters. For management purposes, capture fisheries are divided into two types—large-scale and small-scale (see Box 1).

Although often depicted as an activity dominated by men and boats, small-scale fishing is typically viewed locally as a set of household-wide livelihood activities ranging from catching to culturing, processing, trading, boat and gear-making and repair. Studies show that women and men often also use different landscape and aquatic niches for fishing-

related activities and use their income from fishing for very different household or individual expenditures.

Although fishing roles and activities vary by place, culture, and other factors, men typically dominate the capture sub-sector and women and children typically focus on processing and marketing. Unfortunately, although women's and children's involvement is intense, their contribution is less frequently recognized. Consequently, fisheries-related services and development assistance less often benefit women and children directly or improve the extent of their involvement in fisheries-related decision-making.

Since there is no universal definition of small-scale fishing, and no accurate census of those engaged in the sector, the exact number of fishers is difficult to estimate. Statistics on the numbers of women capture fishers are seldom available. Also, the fact that small-scale fishers can be full-time, part-time or seasonal, adds further to the difficulty in measuring numbers. Where estimates do exist on numbers, however, those estimates vary widely—ranging from 12 million to as many as 50 million men and women directly involved in catching fish globally (Table 1). Other estimates indicate that:

Box 1

Large-scale industrial or commercial fisheries use relatively capital-intensive fishing technologies, with harvesting and processing equipment owned by commercial entrepreneurs and operated by salaried crews.

Small-scale or artisanal fisheries are a more traditional, typically labor-intensive form of fishing performed by men, women and children from fishing households**.** Although sometimes mechanized, more often these small-scale methods involve fishing from small boats or from shore or by gleaning and use of traditional fishing gear, such as hand lines, small nets, traps, spears, and hand collection methods. Fish are marketed from small-scale fisheries. However, for poorer fisher families, including a high percentage of female-headed households, the catch is mainly eaten by the family and this is referred to as subsistence fisheries.

- 96% of fishers worldwide (38 million in 2002 by the Food and Agriculture Organization (FAO) estimates) are small-scale,
- these fishers produce approximately 58% of global fish catches annually,
- the number of part-time fishers increased more rapidly than full-time fishers between 1970 and 1990 (Kura et al. 2004): the number of full-time fishers doubled while the number of part-time fishers increased 160%,
- women are more likely to be involved on a part-time basis in capture fisheries activities due to the level of other household responsibilities,
- the number of full-time fishers has been growing at an average rate of 2.5% per year since 1990—a total of 400% since 1950 (by comparison, the number of agricultural workers increased by 35% in the same period),
- the majority (87%) of the world's fishers and aquaculture workers (33 million, Sugiyama et al. 2005) are in developing countries,
- fisheries has strong links to poverty—e.g., at least 20% of those employed in fisheries earn less than US $1 per day, and

- children often work in the capture and/or processing sectors, exposing them to long work hours and/or dangerous working conditions (see Box 2).

Table 1. Large-Scale and Small-Scale Fisheries Compared

Key Features	Large-Scale Fisheries	Small-Scale Fisheries
Direct employment in fishing	500,000 people	50,000,000 people
Fishery-related occupations	-	150,000,000 people
Fishing household dependents	-	250,000,000 people
Capital cost per fishing job	US $30,000- US $300,000	US $20-US $300
Annual catch for food	15-40 million tons	20-30 million tons
Annual fish by-catch	5-20 million tons	< 1 million tons
Annual fuel oil consumption	14-19 million tons	1-2.5 million tons
Catch per metric tons of oil used	2-5 metric tons	10-20 tons

Source: Berkes et al. 2001

Unfortunately, the lack of (or minimal amount of) reliable data and statistics keeps the economic importance of the fisheries sector hidden from official view, and the implications for national fisheries policy and local economic development unclear. Small-scale fisheries have been systematically ignored and marginalized over the years. In most cases, this was not deliberate—but rather the result of policies and development decisions to "modernize" fisheries. Many policy decisions on fisheries development have also done a poor job of considering gender dimensions. This is often one of many reasons why fisheries policies fail—often with adverse impacts on disadvantaged groups, including but not limited to women. Other problems in the fisheries sector include major conflicts that have broken out between the commercial and small-scale sectors, conflicts which have exacerbated the threats to food security and local economies, and, in some cases, to ecosystem health. In addition, use conflicts related to tourism, recreational, residential and industrial development have driven small-scale fishers and also gleaners, who are primarily women and children, out of traditional fishing, gleaning and landing sites.

Box 2

Child Labor in Fisheries

In Senegal, children under the age of 15 represent approximately 29% of fishery labor. They are forced to enter work in physically demanding and harsh working conditions at an average age of less than 11 years. In Mwanza Tanzania, bordering Lake Victoria, boys and girls labor seven to eight hours a day in the fishing and processing sectors. On Lake Volta, over 1,200 boys serve as "slave masters" onboard fishing vessels. In Thailand, illegal female migrant workers from Burma comprise a significant proportion of the cheap labor employed in processing plants. (Samudra Report, 2006)

2.3 Current Trends and Conditions: The Fisheries Sector in Crisis

Capture fisheries began an inexorable decline in the late 1980s. Ironically, much of the cause for this decline owes to previous development policies that promoted increased

production through expansion of commercial fishing capacity, and provided subsidies to the large-scale sector. Many commentators describe the present global fisheries situation as a crisis, which has both ecosystem and human dimensions. FAO estimates that 25% of the world's major fisheries are overfished, and 40% are fully fished.

Recent assessments (Pauly et al. 1998, 2002; Myers and Worm 2003) show reductions in the size and value of fish caught, and a spectacular decimation of key target species of fish, such as the large predators. The catch decline has brought with it a consequent shift to smaller and less-valuable species—a trend of "fishing down the food webs" from larger predatory species to smaller prey. Associated genetic resources are also being lost. Fishing and other anthropogenic disturbances alter and destabilize aquatic ecosystems, and increase their vulnerability to collapse or species shift. While somewhat controversial in its methodology and findings, one recent study estimated that commercial fisheries could totally collapse by 2048 if management is not drastically improved (Worm et al. 2006).

"Recent assessments show a spectacular decimation of key target species of fish."

The decline of capture fisheries has affected livelihoods, increased vulnerability to poverty, and meant less availability of fish protein per capita. In particular, small-scale fishers have seen their income decline in many parts of the world. Decreasing catches have also reduced resource rents from the fisheries and critical foreign exchange earnings from fish exports and fisheries agreements. Overfishing is threatening the nutritional status of major population groups, particularly of the 400 million people from the poorest African and South Asian countries, for whom fish products can constitute 50% or more of their essential animal protein and mineral intake (although the rapid growth of aquaculture has offset some losses from the decline in capture fisheries). However, this decline puts additional pressure on agriculture and other land resources to provide food or marketable goods, particularly for those involved in subsistence fishing. While women from the poorest coastal and lakeside households are already engaged in trading unprotected sex for fish, the decline in fisheries is likely to lead to further human impoverishment, migration and vulnerability to human trafficking.

The consequences of today's declining state of fisheries disproportionately impact developing countries and their poorest communities and members.

Aggregate global capture fisheries statistics mask what one authoritative analysis has termed the "paradox of abundance and decline," (World Humanity Action Trust 2000) because the figures do not adequately portray the severity of overfishing in the coastal and inland waters of developing countries. Nor do the figures convey the changes taking place in the quality of the supply.

Fisheries in the Asia and Pacific region are a good reflection of the broader global situation. In South and Southeast Asia, demersal (organisms living on or near the sea bed) fish stocks have been fished down to 5-30% of unexploited levels, not only reducing fishers' incomes, but reducing also the contribution of these fisheries to employment, export revenue, and social stability. Marine ecosystems, such as coral reefs, mangroves,

and seagrasses, have been severely degraded in most areas. Human activities now threaten 88% of Southeast Asia's coral reefs, jeopardizing their biological and economic value to society (Burke et al. 2002). In tandem, fishing capacity has increased greatly and is far in excess of the level of activity needed to produce the catches realized and well beyond levels that are sustainable.

The present situation is largely the result of *laissez faire* attitudes, as governments have found it difficult to manage fisheries from the central level. Where decentralization has occurred, local government bodies often lack the capacity and/or funds to undertake fisheries management. Poor sector governance has enabled overfishing to continue and has negatively affected fisheries in ever-larger areas. For decades, production policies have either aimed at expanding fishing capacity, or have used ill-designed and poorly executed measures to limit catches of threatened species. This weak governance has made a bad situation even worse with inappropriate policies, such as continuing subsidy levels supporting the fisheries sector. Further, technological advances in boats, fishing gear and electronics have allowed for greater fishing power and effort. The social impacts from these policies disproportionately and negatively affect rural small-scale fishing communities.

Excessive fishing has not been the only culprit contributing to the problem. The population living within 100 kilometers of the coast has grown to 2.2 billion people (39% of the global population), leading to pollution and degradation of major marine and aquatic ecosystems. Pollution effects and declining water levels have been even more significant contributing factors in inland water bodies. The degradation and loss of critical fish habitat (especially the loss of essential nursery areas in coastal marshes and mangroves), exacerbated by population growth and coastal development, reduces potential fisheries productivity and associated potential economic benefits. Of the gains from inland fisheries in recent years, most are due to the stocking of fish and the introduction of alien fish species in lakes and rivers. Hence, production increases have been at the expense of ecosystem integrity.

Fish have become relatively more expensive than other food items and this trend is likely to continue, again impacting disproportionately upon poor people. Increased purchase prices will also result in a shift by consumers—most of whom are women—from buying fish to buying other sources of protein, particularly chicken and pork. Per capita consumption of fish for food in Asia is expected to increase at 2% per year through the year 2020. One recommendation for meeting increasing demand is for aquaculture to assume more and more of the fish production (Delgado et al. 2003); as noted above, however, aquaculture creates its own environmental and social issues, may not be sustainable, and may decrease capture fisheries health and productivity.

2.4 Future Outlook

In the last decade, policies on fisheries development have started shifting towards more sustainable management. The paradigm of capture fisheries management has also changed—from a narrow, predator-target prey basis to one based on accounting for

effects on other parts of the ecosystem in which a fishery is embedded. Fisheries management now has not only biological objectives but institutional, political, and social objectives. This new approach to fisheries management takes into consideration integrated coastal resources management; rights-based management where fishing rights provide exclusive or preferential access to aquatic resources by individuals or groups; and co-management, in which government and resource users share responsibility for managing the resources. These newer approaches have the potential to expand the role and participation of diverse stakeholders, including both women and men, in decisions about fisheries resources management. This is a step in the right direction. However, the capacity to implement such approaches is largely lacking and many of the management actions needed require moving capital and people out of the fishing sector—a move that requires strong political will, a will that at present is largely absent. In spite of these challenges, if fisheries are governed responsibly and equitably, the sector has great potential to contribute to poverty reduction, economic growth, biodiversity conservation, sustainable livelihoods and peace and security.

2.5 Biodiversity Conservation and Fisheries

Humans have long depended on aquatic resources for food, livelihood, medicines, spiritual practices, materials, recreation and businesses such as fishing and tourism. Aquatic organisms also rely upon the great diversity of aquatic habitats and resources for food, materials, and breeding grounds. Much of the primary productivity in the fisheries food chain is concentrated in shallow water areas where environmental impacts are likely to be widespread. In particular, the degradation of natural habitats poses a serious threat to the fisheries sector.

Overexploitation of species and destructive capture practices are the main causes of declining levels of aquatic biodiversity in both freshwater and marine environments. Other causes include the introduction of exotic species, pollution, climate change, and habitat loss and alteration through development (e.g., damming, water diversion, and conversion to settlements and aquaculture). Valuable aquatic resources are becoming increasingly susceptible to both natural and artificial environmental changes. Fishing pressures have caused the collapse of populations of both target species and non-target species and habitats—the latter through incidental take and destructive fishing practices. This has implications for the entire ecosystem, including the humans who are part of the system and who depend on its resources. Thus, conservation strategies to protect and conserve fisheries are crucial to maintaining the balance of nature and supporting the availability of resources for future generations.

2.5.1 Marine Biodiversity: The Hotspots and the Threats

Current assessments of marine biodiversity identify two centers of fish biodiversity as well as 18 centers of coral reef ecosystem biodiversity. Researchers have long believed that the area with the highest diversity of marine fish species is the Indo-Malay-Philippines Archipelago (IMPA). A recent analysis of distribution of marine shore fish species indicates that the global center of biodiversity is the central Philippines islands,

with a second center or "peak" between peninsular Malaysia and Sumatra (Carpenter and Springer 2005).

Researchers have identified the world's ten leading centers of species richness and endemism among coral reef ecosystems, based on mapping the geographic distributions of reef fishes, corals, snails, and lobsters—groups identified as representative of "reasonable surrogates for reef diversity as a whole" (Roberts et al. 2002). There is a high level of concordance in patterns of species richness across the four taxa, with peaks of species richness in the so-called "coral triangle" of Southeast Asia. The highest levels of richness occurred in the southern Philippines and central Indonesia, which represent the top 10% for all four taxa. Species richness fell off rapidly moving from the coral triangle east across the Pacific and falling off less rapidly moving across the Indian Ocean. Another center of species richness is found in the Caribbean.

By taking the top centers of endemism and assigning scores that measure the threats to reefs from coastal development, overexploitation, and pollution from land-based sources, Roberts et al. (2002) derived a list of 18 marine biodiversity hotspots—those centers of endemism with threat scores in the top third of the range of risk from human impacts. Regions of high biodiversity and endemism—especially in the Indo-West Pacific area—are also among the regions experiencing the highest anthropogenic impacts.

Table 2 ranks marine biodiversity hotspots—many of which are located within USAID presence countries—in terms of their being considered centers of species richness. It also lists the threat score for each of these hotspots.

Marine biodiversity is threatened by both overexploitation of commercial species and by physical damage to ecosystems by certain fishing technologies, referred to as "destructive fishing practices". The process of "fishing down the marine food web"—i.e., the depletion of higher value fish species, which makes less valuable species dominant in the ecosystem—represents a fundamental loss of marine biodiversity (Pauly et al. 1998). The vast increase in fishing capacity in the global fleet is exacerbated in many countries by the use of fine mesh nets, which capture large numbers of juveniles. Bottom trawling in intensively fished areas also causes disturbances to ecosystems well beyond natural background levels (Dayton et al 1995). In Southeast Asia, it is estimated that 64 percent of the region's coral reefs are threatened by overfishing and 56 percent are threatened by destructive fishing techniques (Burke et al. 2002). In the Caribbean, it is estimated that 60 percent of the coral reefs are threatened by overfishing (Burke and Maidens 2004).

Key threats to fisheries and marine biodiversity include:

- Over-exploitation
- Destructive fishing practices, including bottom trawling, the use of poisons (such as cyanide for the live food fish and ornamental trades), and the use of explosives
- Non-selective fishing practices and gear
- Loss and degradation of essential fish habitats, such as coral reefs, mangrove forests, seagrass meadows, estuaries

- Altered freshwater inflows (quality, quantity and timing) into estuaries, wetlands and other fish nurseries
- Sediment and pollution from land-based sources
- Unsound coastal development
- Invasive species, diseases and pests (especially associated with shipping and aquaculture)
- Untreated wastewater discharged into coastal waters
- Global climate change, including altered seawater temperatures and sea levels
- Population growth

Table 2. Top Centers and Hotspots of Marine Biodiversity

Location	**Rank** ***based on widespread species***	**Average Threat Score**	**Rank** ***as marine biodiversity hotspot***
Philippines	1	2.91	1
Sunda Islands (Indonesia)	2	2.53	3
South Japan	3	2.21	7
Great Barrier Reef	4	1.37	12
North Indian Ocean	5	2.22	6
New Caledonia	6	1.42	11
Western Australia	7	1.20	15
South Mascarene Islands	8	2.45	4
Red Sea	9	1.77	10
Eastern S. Africa	10	2.36	5
Lord Howe Island (Australia)	11	1.00	16
West Caribbean (Mexico, Belize, Guatemala, Honduras)	12	1.91	9
Hawaiian Islands	13	1.28	14
Gulf of California (Mexico)	14	1.32	13
Gulf of Guinea	15	2.61	2
St. Helena & Ascension Islands	16	1.00	16
Cape Verde Islands	17	2.20	8
Easter Island	18	1.00	16

(Adapted from Roberts et al. 2002)

2.5.2 Freshwater Biodiversity: The Hotspots and the Threats

Northern South America, Southeast Asia, and sub-Saharan Africa are recognized centers of biodiversity for freshwater fishes. In the Latin America, the Amazon is most important in terms of biodiversity and fisheries. Here, the freshwater fish fauna is the richest in the world—exceeding 3,000 species comprising at least 30 different families represented (Lundberg et al. 2000). In Southeast Asia, it is the Mekong River, the largest river in the region, with fish diversity upwards of 1,700 species that is most important (second only to the Amazon) in terms of fish diversity (Allan et al. 2005). In sub-Saharan Africa, it is the lakes of the Rift Valley and the Congo River basin that support similarly high

numbers of fish species. The following freshwater regions/systems are of global priority for freshwater biodiversity conservation and fisheries.

Asia
- Bangladesh (particularly Ganges, Bramaputra, and Meghna Rivers)
- Indonesia (particularly the rivers in Sumatra and Kalimantan)
- Lower Mekong River basin (Myanmar, Laos, Thailand, Cambodia, Vietnam)

Africa
- Nile River (particularly in southern Sudan)
- Rift Valley lakes (including Lake Victoria)
- Niger River
- Congo River
- Lake Kariba (Zambia/Zimbabwe)

Latin America/Caribbean
- Orinoco River (Colombia and Venezuela)
- Amazon River (Brazil and Peru)
- Paraguay/Parana River systems (Brazil, Paraguay, Argentina)

Major threats to freshwater biodiversity parallel those impacting marine systems. Key threats to fisheries and freshwater biodiversity include:
- Over-exploitation
- Destructive fishing practices, including the use of poisons and explosives
- Non-selective fishing practices and gear
- Altered water flow regimes (quality, quantity and timing) into rivers, streams, lakes and wetlands due to dams, water diversions, and pollution
- Loss and degradation of essential fish habitats, such as wetlands
- Sediment and pollution from land-based sources
- Unsound development
- Invasive species, diseases and pests (especially associated with shipping and aquaculture)
- Untreated wastewater discharged into rivers and lakes
- Global climate change, including altered rainfall patterns and drought/flood cycles
- Population growth

2.6 Regional Assessment of Marine and Freshwater Fisheries

This section of the report presents a brief assessment of marine and freshwater fisheries and aquatic biodiversity in each of the three regions of Asia, Africa, and Latin America and the Caribbean. These marine and freshwater fisheries offer a great deal of diversity in terms of their social, economic, technical and biological characteristics. The sections below are based on the best available fisheries information for each region. However, this information has a high degree of uncertainty.

2.6.1 Asia

Marine Capture Fisheries

Asian countries are among the world's major producers of fish products. Thirteen of the top 20 fishing nations in 2003 were Asian countries, collectively producing about 38.3 million tons, or 42% of world capture fishery production (90.2 million tons). The People's Republic of China (PRC) is by far the largest producer, with 16.7 million tons. However, the PRC fishery statistics are thought to be inflated and in recent years the Food and Agriculture Organization (FAO) has separated them from the rest of the world in its global statistics. PRC is followed by Indonesia (4.7 million tons), India (3.7 million tons), Thailand (2.8 million tons), and Philippines (2.2 million tons). Other countries in this group, in order of share of total catch, are Republic of Korea, Myanmar, Malaysia, Bangladesh, and the Republic of China. All have more than one million tons of total capture fishery production. For aquaculture, the regional share of global production was 91%, with the PRC alone accounting for 79%.

Approximately 70% of the overall capture fishery production comes from marine fisheries resources that are distributed over 130,000 kilometers (km) of coastline, about 6 million square kilometers (km^2) of known shelf area, and more than 32 million km^2 of actual or potential exclusive economic zone. These marine fish resources are concentrated in the northern Indian Ocean, the South China Sea, the western central Pacific Ocean, and the northwestern Pacific Ocean.

Total fishery production in the Asia and Pacific region increased by about 26% between 1997 and 2003, the latest year for which FAO production statistics are available. Table 3 shows capture fishery production data by sub-region. FAO fishery statistics are not categorized by whether they originate from large-scale and small-scale fisheries, and it is generally not possible to separate the two with any degree of confidence.

Table 3. Capture Fisheries Production in Asia and Pacific Sub-regions

Sub-Region	1997 ('000 ton)				2003 ('000 ton)				Change (%)
	Freshwater	Marine	Other	Total	Freshwater	Marine	Other	Total	
Central Asia	38	<1	22	59	32	< 1	21	53	-11
East Asia	13,139	12,252	13,735	39,126	18,727	12,576	18,030	49,333	26
Mekong	1,218	3,718	1,123	6,059	2,154	4,523	1,602	8,279	37
South Asia	3,463	3,265	964	7,691	4,398	3,468	1,095	8,962	17
Southeast Asia	788	5,570	1,589	7,947	1,104	6,074	2,585	9,762	23
Pacific	11	226	25	262	11	389	15	415	58
Total	**18,656**	**25,031**	**17,458**	**61,145**	**26,426**	**27,031**	**23,347**	**76,804**	**26**

Source: FAO

In terms of share of gross domestic product, the contributions of fisheries range from 34% in small island countries in the Pacific, such as Kiribati and Marshall Islands, to approximately 3% in Asian countries, such as Indonesia and Vietnam. However, these figures are frequently underestimated due to poor reporting. The share of fish exports in total agricultural exports was high for Maldives (99%), Tuvalu (96%), Marshall Islands

(92%), Bangladesh (75%), Cook Islands (71%), Republic of China (65%), Kiribati (61%), and Vietnam (52%). For the rest of the countries, this share was up to 38%.

Small-scale fishing, which makes up the bulk of employment in the sector in Asia, is much more significant as a source of livelihoods, food security, and income than is often realized. In terms of the estimated distribution of small fishers across Asia, approximately 36% of small-scale fishers live in the PRC, 26% are from South Asia, and 38% from Southeast Asia. It is estimated that when full-time, part-time, and seasonal men and women fishers are included, there may be more than 40 million small-scale fishers in the region.

Fish provide more than 20% of animal protein consumed by more than 1.6 billion of the 3.5 billion people in the region. This figure rises to more than 50% in such countries as Bangladesh, Cambodia, Indonesia, and Sri Lanka. Inland fish production provides an often irreplaceable source of protein in many areas of Asia, such as along the Mekong River. In Southeast Asia, with a population of over 510 million, of whom approximately 35% live below the poverty line, average fish consumption is 22 kilograms per capita per year and is even higher in coastal communities.

Marine capture fisheries production is not expected to keep pace with demand, creating concerns for food security in the Asia region. Access to or exclusion from fisheries resources may influence the vulnerability of people to both poverty and food insecurity. Production from coastal capture fisheries in the region will decline over the next 10-20 years unless excess fishing capacity and fishing effort are greatly reduced. Prospects for increasing catches are further dimmed by some fishing methods used by small-scale fishers—methods such as using cyanide and explosives, which have had a devastating impact on coastal fisheries and fish habitats, and the health and welfare of fishing households. Although it is men who are more often maimed from explosives and disabled as a result of gear-less diving, it is the women of the households who must shoulder the burden of these men's care and who must increase their own income-earning activities to replace the lost income previously earned by these men.

Inland Capture Fisheries

Inland or freshwater fisheries contribute about 30% of the overall fisheries production in the Asia Pacific region; and the region produces 65% of the global inland fisheries catch. However, the contribution of inland fisheries is seriously underreported, and may amount to double or triple the reported production levels. Asia has abundant freshwater resources, more rivers (49) than any other continent, and the highest cumulative river channel length. Their seasonal floodplains all support major fisheries. Over many centuries, reservoirs have been constructed across Asia and range from large dams to small rain-fed ponds. In contrast, there are few natural lakes. Inland capture fisheries operate using a wide range of fishing gears, and across a range of environments and social and cultural contexts and are difficult to access and to monitor. Lack of data on these inland small-scale fisheries has made it difficult to collect information on catch and number of fishers. Undoubtedly, women play significant but underreported roles in inland fishing. Thus, the

importance of inland fisheries to rural livelihoods in many countries has probably been greatly underestimated for decades. Much of the small-scale inland fisheries catch is consumed locally and goes unreported. The main exceptions are the industrialized fisheries on the lower Mekong basin, especially the Tonle Sap in Cambodia, and Myanmar.

Freshwater harvests contribute 10% of global fish production. In 2002, Asia contributed two-thirds or approximately 8.7 million tons. Overall, catches are increasing in the region at a rate of approximately 1% annually. South Asia has the largest share of inland capture production (29%) among sub-regions in the Asia region. While inland production was relatively stable during the late 1970s and 1980s, it grew rapidly starting in the early 1990s. It reached a peak of 1.9 million tons in 2001, but showed a sharp decrease in 2002—the first decrease in the past ten years. In Southeast Asia, inland production has increased gradually and reached 1.5 million tons in 2002. Considering the rich freshwater resources in the sub-region, this total is commonly thought to be significantly underestimated.

Of the two-thirds or 8.7 million tons of freshwater harvest produced by Asia in 2002 (FAO 2004), the People's Republic of China (PRC) produced approximately one quarter (25.7%) of that figure. The PRC together with the following five countries are the world's top six producer countries:

- India (9.3%)
- Bangladesh (7.9%)
- Cambodia (4.1%)
- Indonesia (3.5%)
- Myanmar (3.5%)

Cambodia is the preeminent country in annual per capita inland capture fisheries production with 28.2 kg in 2002—exceeding other countries by a factor of more than three. Other countries in Asia with a high per capita inland capture fisheries production are Bangladesh, the Lao People's Democratic Republic (Lao PDR), and Myanmar with approximately 5 kg per capita.

Most freshwater systems in Asia are stressed by habitat loss and degradation and changing water flow regimes due to dams, water diversions, and pollution. This has affected water quality and quantity, fish migration patterns, and habitats. Throughout Asia, most capture fisheries that rely on natural reproduction are overfished or are being fished at their biological limit. **Rather than indicating healthy fish stocks or healthy aquatic ecosystems, the observed increases in inland fish harvests over the last two decades reflect widespread fish stocking and the introduction of alien fish species.** Among the identified aspects of fisheries depletion in inland waters is this collapse of native fish stocks even as fish production rises. This is a biodiversity crisis and a fisheries crisis. Added to these problems is considerable human population growth, which is increasing the competition for water resources at the same time that institutional and political recognition of the importance of inland fisheries remains low.

2.6.2 Africa

Table 4. Capture Fisheries Production in Sub-Sahara Africa for 2004 (tons)

USAID Countries	Total Capture	Marine Capture	Inland Capture	Percent Marine	Percent Inland
Angola	240,005	230,005	10,000	96	4
Benin	39,988	11,788	28,200	29	71
Burundi	13,431	0	13,431	0	100
Djibouti	260	260	0	100	0
DR Congo	220,000	5,000	215,000	2	98
Ethiopia	10,005	0	10,005	0	100
Eritrea	7,404	7,404	0	100	0
Ghana	399,370	324,370	75,000	81	19
Guinea	92,550	88,550	4,000	96	4
Kenya	126,965	7,872	119,093	6	94
Liberia	10,358	6,358	4,000	61	39
Madagascar	128,958	98,958	30,000	77	23
Malawi	56,463	0	56,463	0	100
Mali	100,000	0	100,000	0	100
Mozambique	44,683	25,924	18,759	58	42
Namibia	570,708	569,208	1,500	>99	<1
Nigeria	465,251	282,987	182,264	61	39
Rwanda	7,400	0	7,400	0	100
Senegal	445,263	395,263	50,000	89	11
Sierra Leone	134,400	120,400	14,000	90	10
Somalia	27,500	27,300	200	>99	<1
South Africa	881,939	881,039	900	>99	<1
Sudan	59,008	5,008	54,000	8	92
Tanzania	348,112	49,587	298,525	14	86
Uganda	371,789	0	371,789	0	100
Zambia	65,000	0	65,000	0	100
Zimbabwe	13,000	0	13,000	0	100

Source: FAO

Marine Capture Fisheries

Ten-year trends of the fisheries of the five Large Marine Ecosystems (LMEs) in Sub-Saharan Africa (Canary Current, Guinea Current, Benguela Current, Agulhas Current and Somali Current) reveal declines in catches. The combined total marine catch for the five LMEs in 1990 was 4.65 million tons, but by 1999 this figure had fallen to 3.47 million tons. The Canary Current LME, accounting for half of the total catch of the five LMEs, had 2.3 million tons in 1990 but dropped off to 1.8 million tons in 1999. The marine fish catch in the West African sub-region is dominated by small pelagic species, which account for nearly 50% of total catches. **In some countries, such as Senegal, up to 70%**

of fish landings are attributed to small-scale fishers. Production trends in the small-scale sector follow the overall downward production trend in most countries.

By 2002, as noted by the Fishery Committee for the Eastern Central Atlantic (CECAF), the overexploitation of stocks had become more generalized for the fifteen West African countries belonging to the Committee. It concluded that the catch trends from 1987 to 1998 as well as the levels of exploitation in relation to biomass potential yields for pelagics, demersal stocks, shrimps and cephalopods in the region indicated that those stocks were either fully exploited or overexploited. The Scientific Committee of CECAF recommended at its 2004 session that fishing effort should be reduced or stopped completely on 23 of 53 commercial stocks assessed in the region, and that in no case should effort be increased (FAO, 2004). However, the species that have been depleted have generally been those of interest to foreign fleets. There are some Sub-Saharan African coastal fisheries which remain underexploited, particularly those in deep ocean waters and in countries where the industrial fleet has not been highly developed.

Fish exports from Africa grew from US $1 billion in 1986 to over US $3 billion in 2002 (FAO, 2004). Fish products make up more than 10% of the total value of national exports in 11 African countries. In a few cases, that percentage is much higher. In **Mozambique**, for example, prawns accounted for 40% of all export revenues for the past 15-20 years.

Ten million people have been estimated to make their living as fishers in Sub-Saharan Africa—the overwhelming majority of which are small-scale fishers and those involved in related small-scale processing and trading. In West Africa alone, where the most productive marine fisheries are concentrated, approximately five million people are believed to be dependent on the fisheries sector for their livelihoods. Of those five million, it is estimated that 1.8 million individuals, 90% of which are women, are involved in processing and marketing. Data on six West African countries show that employment in the small-scale sector, stated as a percentage of total fisheries sector employment, ranges widely from very low (11-20%) in **Cape Verde**, **Gambia** and **Guinea-Bissau** to very high (94-97%) in **Senegal** and **Guinea.** The overwhelming majority of small-scale fishers still use non-motorized canoes, although the percentage of motorized canoes has increased since the 1980s.

Production from capture fisheries in Sub-Saharan Africa is failing to keep up with a rapidly growing human population. In **Nigeria**, if one uses a target figure of 12 kg per capita per annum and a population figure of 100 million, total annual fish supply meets only about 50% of the target. The importance of fish as animal protein is highest in coastal and riverine communities. In **Nigeria**, for example, it is estimated to account for 80% of protein in those communities, as compared to only supplying 20-25% of protein for the total population.

In the absence of concerted and effective efforts to change the way African fisheries are managed, the trend lines will continue as they have in the past two decades. The results will include a continued “fishing down of food webs” in African fishing waters, the

disappearance of more and more important fish species, and a likely sharp decline in the future amount of fish available for food in African countries. Further, land degradation is also likely to result from declining African fisheries. This outlook would be particularly disastrous for small-scale fishing communities, which are most heavily dependent on in-shore fishery resources—resources most heavily impacted by the present system of de facto open-access fisheries. As small-scale fishers move farther out to sea in search of fish, the process of "fishing down the food web" moves outward as well. However, while the fisheries for species of worldwide interest are becoming depleted, some Sub-Saharan African coastal fisheries remain underexploited, particularly those in deep ocean waters and in countries where the industrial fleet has not been highly developed.

The absence of concerted and effective efforts to change the way African fisheries are managed will result in a likely sharp decline in the amount of fish available for food in African countries.

Inland Fisheries

Africa's freshwater fisheries are overwhelmingly small-scale and informal, and just as with marine fisheries, supply affordable protein to millions of people throughout Africa. Millions of men and women are involved in the fishery. Women actually fish in some areas, but predominately are involved in processing and trading activities, particularly in West, Central and East Africa. Fully 99% of fishers in Africa are involved in small-scale fisheries. Approximately 50% of the continent's fish supply is of freshwater origin (see Table 4)—significantly more than in other parts of the world. Commercial freshwater fisheries, in the sense of a capitalized industry providing higher value products, are almost non-existent on the continent, with the exception of Nile Perch frozen fillets exported from Lake Victoria to Europe and the Lake Kariba fishery and a few other products. The Nile Perch is an introduced species that has severely altered the natural ecosystem and biodiversity in Lake Victoria, as well as the local social system and local fish availability.

Box 3

Inland Fisheries Statistics among 27 USAID Countries in Sub-Saharan Africa

- Twelve of these countries derive 50% or more of their fish from inland freshwater capture fisheries
- Eight of these countries are landlocked and derive 100% of their fish from inland freshwater capture fisheries
- The top 6 producers are Uganda (371,789 tons); Tanzania (298,525 tons); Democratic Republic of Congo (215,000 tons); Nigeria (182,264 tons); Kenya (119,093 tons); and Mali (100,000 tons)

Welcomme (1989) identified the Nile, Zaire, Niger, Zambezi, Senegal and Charie Rivers as the principal river fisheries in Africa, noting that these fisheries are primarily small-scale or subsistence. African reservoirs also support fisheries, although their productivity varies greatly. The trends in Box 4 are exacerbated by rapid population growth. Another threat of potentially great significance is climate change. It is African countries whose fisheries sectors and fishing people are most vulnerable to climate change, and it is the continent's most semi-arid countries with significant coastal or inland fisheries that will

be most impacted. Depending on the climate change scenario predicted, African countries rank 13 and 14 on a list of the top 15 countries whose fisheries are most vulnerable to the effects of global climate change.

Box 4

Key Characteristics and Trends Affecting Africa's Inland Fisheries

- Poor data
- Lack of visibility
- Weak capacities, and a management vacuum
- Dams and the diversion of water for irrigation
- A break-down in traditional management systems
- An increasing tendency to over-fish
- A strong need for community-based management
- A need to re-think fisheries assessment and management tools for data-scarce environments
- Growing interest in aquaculture; and important transboundary fisheries that present additional challenges for management

2.6.3 Latin America and the Caribbean

Table 5. Capture Fisheries Production: Latin America and Caribbean for 2004

USAID Countries	Total (tons)	Marine (tons)	Inland (tons)	Percent Marine	Percent Inland
Bolivia	6,746	0	6,746	0	100
Brazil	746,217	500,116	246,101	67	33
Colombia	151,315	100,803	50,512	66	34
Cuba	37,325	34,811	2,514	93	7
Dominican Republic	14,223	12,243	1,980	86	14
Ecuador	335,811	335,411	400	99	<1
El Salvador	42,415	40,210	2,205	95	5
Guatemala	13,831	6,531	7,300	47	53
Guyana	56,717	55,917	800	99	1
Haiti	8,310	8,010	300	96.	4
Honduras	14,939	14,839	100	99	<1
Jamaica	13,471	13,071	400	97	3
Mexico	1,450,231	1,353,016	97,215	93	7
Nicaragua	19,297	18,431	866	95	5
Panama	192,485	192,079	406	99	<1
Paraguay	22,000	0	22,000	0	100
Peru	9,613,180	9,575,654	37,526	99	<1

Source: FAO

Marine Capture Fisheries

The Latin America and Caribbean (LAC) region has both very productive and diverse fish stocks—e.g., the anchovy fishery off the coast of Peru is the most productive large-scale fishery in the world. For some countries in the region, marine artisanal fisheries result in approximately 50% of the region's overall fish catch. Also, the Caribbean region's coral reefs have high levels of biodiversity that support many small-scale fisheries and coastal communities. In many areas, especially in the Caribbean, fisheries represent the main form of employment and the primary source of food protein. While fisheries do not represent a large part of most LAC national economies, if international trade of marine seafood continues to increase, economic opportunities will emerge. At the same time, however, if the trade is not well managed, the risks to local food security and biodiversity will increase.

Caribbean Marine Capture Fisheries

Approximately 116 million people live within 100 km of the Caribbean coast (Burke and Maidens et al. 2004). For the nearshore area, coral reef fisheries are most important in terms of yield and impact on biodiversity. Coral reef fisheries use a wide variety of gears to catch numerous species. Since most of the fishing is small-scale, it is likely that a substantial proportion of the catch is unreported.

While comprising only a small part of the overall economy of most countries in the region, marine capture fisheries are nevertheless important locally and of increasing value internationally. (Currently, the major Caribbean Community and Common Market/CARICOM exporters—the regional block of thirteen countries—export fishery products representing less than 1% of the total world fishery products.). Over the period 1999-2001, the major exporters (Rankine et al. 2004a) were:

The Bahamas (US $83.01 million)
Suriname (US $39 million)
Belize (US $28 million)
Guyana (US $28 million)
Jamaica (US $13 million)

The United States is, by far, the most important international market for Caribbean fisheries products (Rankine et al. 2004a and 2004b). Based on FAO statistics, the estimated combined 2000-2002 fishery exports to the U.S, the European Union (EU) and Canada were estimated at US $294.3 million (68% of the dollar value went to the U.S.; 28% to the EU; and 4% to Canada). Meanwhile, 96% of **Jamaican** marine fisheries exports went directly to the United States. Certain marine fish species in the region are almost exclusively for export. Trade of crustaceans, including spiny lobster, generated the highest value trade at US $199.4 million. Between 1998 and 2000, 94% of **Belize** crustacean exports went to the U.S.

Multiple stressors on the Caribbean marine realm are having widespread impact on marine systems and associated human communities (Burke and Maidens et al. 2004; Hughes et al. 2003; Mumby et al. 2006). The decline of ecologically critical species—such as coral reef grazers susceptible to mass die-offs (as in the case of sea urchin *Diadema spp*. in 1983) or those overexploited for local consumption (as in the case of parrotfish)—results in long-term habitat degradation (Mumby et al. 2006). Within the fisheries sector, overcapacity, subsidies for large-scale fisheries, aquaculture impacts, poorly managed globalization of trade, ineffective governance, and lack of information are key factors resulting in increasing and unregulated fishing efforts and unsustainable fisheries. While it is increasingly clear that marine fisheries resources are, in general, overexploited in the Caribbean, the scale and scope of the problem are poorly understood. Proper management of fisheries and marine ecosystems must be linked to a sustainable tourism economy—which is a significant segment of the overall Caribbean economy.

In the Caribbean, the governance context presents a challenge for area-wide management. As many as 38 countries and dependencies border the Caribbean Sea Large Marine Ecosystem (LME), and need to address the numerous transboundary issues. **Further, there is a growing concern that fisheries may become increasingly dominated by foreign fleets and local jobs and food availability will decline as a result.**

Latin America Marine Capture Fisheries

Table 6. Capture Fisheries Production: Latin America and Caribbean for 2004

USAID Countries	Total (tons)	Marine (tons)	Inland (tons)	Percent Marine	Percent Inland
Bolivia	6,746	0	6,746	0	100
Brazil	746,217	500,116	246,101	67	33
Colombia	151,315	100,803	50,512	66	34
Cuba	37,325	34,811	2,514	93	7
Dominican Republic	14,223	12,243	1,980	86	14
Ecuador	335,811	335,411	400	>99	<1
El Salvador	42,415	40,210	2,205	95	5
Guatemala	13,831	6,531	7,300	47	53
Guyana	56,717	55,917	800	99	1
Haiti	8,310	8,010	300	96	4
Honduras	14,939	14,839	100	99	<1
Jamaica	13,471	13,071	400	97	3
Mexico	1,450,231	1,353,016	97,215	93	7
Nicaragua	19,297	18,431	866	95	5
Panama	192,485	192,079	406	>99	<1
Paraguay	22,000	0	22,000	0	100
Peru	9,613,180	9,575,654	37,526	>99	1

Source: FAO

The current state of fisheries in Latin America is also poorly understood and documented, with the most comprehensive analysis published a decade ago (Christy 1997). It is almost certain, though, that the trends established by that report have continued or accelerated. As in most developing countries, fisheries have been expanding in those areas with increasing international trade. According to Christy (1997), Latin American countries paid little attention to fisheries development in the 1960s. The development of the Peruvian anchovy fishery was initiated at that time by U.S. entrepreneurs, with little government or development bank support. By the 1970s, many Latin American governments set up inefficient parastatal fishing enterprises with considerable external aid. During this decade, 28 states showed marine catch increases greater than 25%. While overall expansion was slowed in the 1980s, partly due to the reduced catches from the anchovy stocks, there also was a shift in production from lower-value to higher-value and lower-volume fish for human consumption. In the same time period, some countries rapidly expanded their fisheries—with **Argentina** and **Venezuela** increasing yields by 90% and **Colombia** by 200% (Christy 1997).

Trends in fisheries production for Latin America are not encouraging. By far, the fisheries of **Peru** and **Chile** are the most productive, with much of their small pelagic fish being processed into fish meal. In 1993, the catch of these two countries alone totaled 80% of the total yield from the Latin American region (Christy 1997). However, the wide fluctuations in anchovy stocks, due to overfishing and climate variability, have been a major destabilizing factor. Nearshore fisheries are generally in a state of decline. Interestingly, in some areas of Latin America, notably **Brazil**, women are involved in boat fishing. In general, the unmanaged introduction of modern fishing methods and the break down of traditional management practices is a consistent story in the region.

Inland Capture Fisheries

Several countries in the Latin America and Caribbean region have significant inland capture fisheries (see Table 5). **Bolivia** and **Paraguay** have *only* inland freshwater capture fisheries since they are both landlocked countries:

- **Bolivia** 6,746 tons
- **Paraguay** 22,000 tons

Three other countries' inland fisheries contributed substantially to national catch totals:

- **Guatemala** (7,300 tons—53% of total catch)
- **Brazil** (246,101 tons—33%)
- **Columbia** (50,512 tons—34%)

The remaining twelve countries in the Latin America region had inland fisheries that contributed 0.2%-14% of total annual catch.

Reservoir fishery yields tend to be higher for the Caribbean than in Central and South American reservoirs (e.g., **Cuba** 125 kg/ha/year; **Dominican Republic** 29-75 kg/ha/year

versus **Brazil** 2.1-11.5 kg/ha/year; **Panama** 4.8-63.2 kg/ha/year) (Jackson and Marmulla 2001). As the range of values suggests, reservoir production can be quite variable, depending on flushing rates, elevation, and basin morphology. Highest yields often result from the stocking of exotic species. Important recreational fisheries and related tourism are associated with warm water reservoirs (e.g., largemouth bass *Micropterus salmoides* in **Cuba, Puerto Rico, Dominican Republic, Mexico**; and peacock bass *Cichla ocellari*s in **Panama**). At higher elevations, and particularly in the Andes, coldwater systems (lentic and lotic) support successful fisheries for rainbow trout (*Oncorhynchus mykiss)* and brown trout (*Salmo trutt*a). Such recreational fisheries have become increasingly important, underlying a growing tourist industry.

Coastal lagoons can support important inland fisheries in the region, and particularly in the Caribbean. These systems can range from being nearly fresh water to nearly marine environments. By mainland standards these fisheries are small, but from the social and cultural perspective of people living on Caribbean islands they are generally considered large and in relatively wild and natural settings.

Larger rivers in South America support significant commercial, small-scale, and subsistence fisheries. Particularly important are the Amazon, Orinoco, Magdalena, and the integrated Paraguay/Parana/Plata River systems. These fisheries have particular subsistence significance to the indigenous populations living near these rivers, as well as the poorer *mestizos* in these areas. The rivers of Central America and the Caribbean are typically short and steep, supporting capture fisheries that are primarily local in extent. In terms of both biodiversity and fisheries, the Amazon is the most important Latin American river system.

3. Issues Related to the Sustainability of Small-Scale Fisheries and Threats to Biodiversity

Major issues facing the sustainability of small-scale fisheries and biodiversity conservation can be broadly categorized as weak governance, socioeconomic conditions, and ecosystem change.

3.1 Weak Governance

Weak governance is one of the main causes of the present poor condition of fisheries. Governance may be defined as "the sum of the many ways individuals and institutions, public and private, manage their common affairs." It includes formal institutions and regimes empowered to enforce compliance as well as informal arrangements that people and institutions either have agreed to or perceive to be in their interests (Commission on Global Governance 1995). Good governance is essential for achieving most development goals. Increasingly, greater attention is being given to identifying the changes in governance that can improve the ways public and state affairs are conducted. "Good governance is, among other things, participatory, transparent and accountable" (UNDP 1997, p2-3). Factors characterizing weak governance in fisheries include (but are not limited to) corruption, conflicts of interest, inadequate resources (physical, human and financial) available for fisheries management, poor enforcement, illegal fishing, lack of stakeholder participation in decision-making by both men and women, lack of a clear vision for the fisheries, and user conflicts.

3.1.1 Corruption

There is anecdotal information on corrupt practices in the fisheries sector in a number of countries. Demands for illegal payments for fishing licenses, permits, or access rights by politicians and public servants, are probably the most pervasive form of alleged corruption in the fishery sector. Many corrupt situations are common, including permitting officers having vested interests in fishing companies and bribes demanded of fish market vendors.

3.1.2 Lack of Participation in Governance and Management

The centralized fisheries management approach involves little effective consultation with resource users. It is often not suited to developing countries with limited financial means and expertise to manage fisheries resources in widely dispersed fishing grounds. It has been recognized that a fishery cannot be effectively managed without the cooperation of both men and women fishers and other stakeholders in helping the laws and regulations to work.

Women have often been underrepresented, as participants and leaders, in fisheries governance—at local, sub-national and national levels. In multi-stakeholder planning processes, women are often not included as representatives of stakeholder groups. Without adequate representation, their perspectives on fisheries issues have rarely been

included in policy reform processes. For example, very little consideration has been given to the fisheries processing and marketing sectors, where women often dominate, or on the important role of women in fisher households. As a result, both services and technology have been biased toward male boat fishers. Gender inequality undermines the effectiveness of traditional community-based systems, state-sponsored fisheries management interventions, as well as newer forms of management.

3.1.3 Poor Enforcement

The inability to enforce regulations that have been centrally promulgated—with little stakeholder involvement—has been the downfall of many fisheries management schemes. Small-scale fisheries with large number of fishers widely dispersed in inaccessible places are particularly resistant to top-down approaches. There are a number of reasons why top-down enforcement is ineffective. Without stakeholder participation by men and women, fishers and others in this sector do not perceive regulations as legitimate. The result is low compliance with rules and over-reliance on stronger enforcement actions to deter illegal behavior and force higher compliance. In addition, small-scale fishers and traders are often among the poorest people in society. Therefore, the political and judicial will to enforce regulations on them is often absent, especially when the action is seen as taking food from the fishers' families. The fact that the impact may be short-term, and that there may be expectations of increased food availability in the long-run, is not persuasive in these situations. Furthermore, in most countries, the judicial systems are bogged down with cases that the courts inevitably perceive as more important than enforcement of fishery regulations.

3.1.4 Weak Institutional Capacity

In the Latin America and Caribbean region, Christy (1997) highlights the impacts of weak governance through the widespread failure of both fisheries development and management programs. This scenario may have resulted in reduced donor effort in this sector. At the national government level, the institutional response to these issues has been generally disjointed and inconsistent. In some cases, trade liberalization and market penetration of fisheries can exacerbate overfishing. These negative impacts may become more acute as fisheries are negotiated under World Trade Organization (WTO), deliberations which tend to erode national-level protections.

African fisheries management is characterized by institutions that have been too weak to cope with the burdens of controlling industrial fleets and empowering small-scale fishers. With few exceptions, they have been unable to stand up to European fishing fleets and other powerful fishing interests. They have largely failed to establish a coherent system of regulations that limit entry, reduce capacity, establish appropriate fisheries management reference points, enforce gear regulations and spatial and time restrictions, and redirect subsidies away from production.

In Southeast Asia, institutional weaknesses and constraints are pervasive in the fisheries resource management sector. Legal, policy and institutional frameworks are not crafted to

suit the unique features of fisheries and this has resulted in mismatches and overlaps. A recent study has concluded that overlapping mandates, institutional confusion and conflict have become the dominant features on the administration of fisheries resources in the region (Torell and Salamanca 2002).

While the delivery of gender-sensitive fisheries programs requires training of both male and female staff, this can be problematic since government ministries, NGOs and educational institutions typically have far fewer women staff and students. This situation has been improved in countries and regions where: 1) senior leaders have undergone gender sensitivity training; 2) support facilities are created that remove obstacles to women's participation and ensure women's safety; 3) educational curriculum addresses gender issues related to fisheries; and 4) female literacy is high. Mentoring has also been important to encourage young women and younger professionals to enter and advance in the fisheries sector. Further, increasing the number of women staff in fisheries ministries and NGOs improves access to women clients and promotes sensitivity to their needs.

3.1.5 Over-Capacity of Fishing Fleets

For many developing countries, small-scale fisheries are systematically overfished—defined as the action of fishing beyond the level at which fish stocks can replenish themselves through natural reproduction—due to high levels of overcapacity. Overfishing has resulted in increased poverty, decline in incomes, decreasing food security, loss of economic rent from the fishery, loss of livelihoods, conflict, and increasing civil insecurity. In these small-scale fisheries, there are far too many fishers than the fisheries can sustain. Over-capacity in the commercial sector leads to increased fishing in nearshore areas where small-scale fishers and the poorest households operate. This increases conflicts, often at the expense of small-scale fishers. International policy discussions of the fishing fleet overcapacity problem have focused overwhelmingly on industrial fishing fleets, largely ignoring problems of small-scale fisheries. Furthermore, there is a dearth of research and policy analysis in most countries with important small-scale fisheries sectors on how to reduce excess capacity in those fisheries.

Fisheries managers recognize that traditional methods of controlling overexploitation of fisheries resources have failed and they have become increasingly aware of the need to develop different, yet appropriate, policies for facilitating the exit of capital and labor from this overexploited sector. These policies must address livelihood and employment alternatives for both men and women currently involved in the fisheries sector. This growing consciousness of the importance of reducing fishing overcapacity culminated in the adoption by the FAO of an international plan for managing fishing capacity. But the focus of capacity reduction efforts at both international and national levels has been primarily on industrial fisheries. Developing countries with small-scale fisheries with severe overcapacity are unlikely to prepare effective plans to address that aspect of fishing overcapacity in coming years without initiatives to help analyze the problem and generate new policy options.

3.1.6 Inadequate Information

One of the greatest obstacles to decisions and policy-making with regard to small-scale fisheries is the lack of reliable data and information about various facets of the sector. Facilitating optimal conditions for small-scale fishers depends on access to good information upon which appropriate policies and strategies can be based. This requires improved data collection, as well as further research on small-scale fisheries to better understand the contribution, role and importance of this sector. Currently available statistics are often highly inaccurate and minimally useful, and seldom sex-disaggregated or gender-related. Furthermore, conventional fisheries statistics and information systems developed for northern large-scale industrial fisheries systems are poorly suited for tropical fisheries due to the multi-species nature of tropical fisheries which have large numbers of fishers, extensive involvement of both adults and children in fisheries activities, numerous dispersed landing sites, and a high proportion of the landings catch consumed locally—i.e., landings that do not enter commercial market chains.

3.1.7 Illegal Fishing

Illegal fishing has a large impact on fisheries, fishers, and the sustainability of fisheries ecosystems. **Illegal fishing is said to account for up to 30% of total catch in some important fisheries and to cost developing countries US $2-15 billion per year.** Illegal fishing in small-scale fisheries differs from that in commercial/industrial fisheries. Small-scale illegal fishing involves such practices as the use of explosives and chemicals and small-mesh nets, and the targeting of fish-spawning aggregations. In developing countries, illegal fishing by large-scale vessels, including distant-water fleets, is widespread. Such boats often come into conflict with small-scale fishers by encroaching on inshore waters, increasing competition for the resources, and leaving such areas depleted and habitats degraded. Illegal practices by small-scale fishers themselves are difficult to regulate in view of their scattered nature and the generally poor monitoring, control, and surveillance systems in most developing countries (Environmental Justice Foundation 2000). Lack of stakeholder participation also reduces perceived legitimacy of regulations by fishers, thereby reducing voluntary compliance, and increasing the need to rely on ineffective top-down enforcement strategies. Illegal fishing results in loss of biodiversity, decreased food production and food security, and decreased livelihood opportunities. In addition, death and disabilities resulting from this type of fishing result in added caretaking for women and increased pressure to find livelihood alternatives.

3.2 Socioeconomic Conditions

A number of socioeconomic factors both constrain improved fisheries management and are root causes of some overfishing problems. For instance, poverty among many fishing communities and households often leads to or reinforces unsustainable fishing practices. Pulling fishing households out of poverty is, in itself, constrained by few livelihood options and by high population growth rates in shoreline and coastal communities. **Fishing communities often have poor health infrastructure due to physical and economic isolation and several studies have shown that they often have higher**

infection rates and vulnerability to HIV/AIDS. There also is significant gender differentiation in the ways men and women utilize and perceive fisheries resources. These differences are distinct from inland and traditional agricultural societies. Failure to fully understand gender roles, inequalities and perspectives have confounded many well-intended fisheries development and conservation initiatives. In addition, technological changes such as the introduction of motorization and of monofilament nets have enabled fishers to exploit nearshore as well as offshore fisheries more intensively than was ever imagined a few decades ago. All of these factors have contributed to unsustainable fishing practices and make finding practical solutions more difficult. These factors are described in more detail below.

3.2.1 Poverty

Many rural communities have low priority in national economic development planning and thus have been left behind as economic development has progressed in other parts of the country. In addition, while most rural residents have little voice in national and sub-national planning processes, women's voices and priorities on issues related to the fisheries sector are even less likely to be heard—owing to their lower overall political and economic status.

Rural fishing communities generally have a higher percentage of people living below the poverty line than the national average (Whittingham et al. 2003). Amongst the poorest households, the percentage of female-headed households is higher than for other socioeconomic classes. Women and children tend to be disproportionately impacted by poverty, particularly when gender inequality reduces women's access to resources and livelihoods. This reduced access to resources in turn limits women's access to the very credit needed to initiate and expand their fisheries-related enterprises. Women employed in the fisheries sector are more often the last hired and first fired and their conditions of employment, including wages, benefits and job security, are inferior to their male peers.

Other factors contributing to the poverty of these rural fishing villages include high population growth, limited alternative livelihoods, limited access to land, economic and political marginalization, unsustainable land use practices and development, competition and conflicts over resources, health burdens, and civil strife. These rural fishing communities become even more vulnerable as resource conditions change and decline. Overfishing has reduced the contribution of fisheries to employment, export revenue, food security and rural social stability. Furthermore, as a result of human activities that contribute to mangrove removal, siltation and pollution, essential coastal fish habitats are degraded, resulting in less productive fisheries.

3.2.2 Globalization of Trade and Market Access

Small-scale fisheries are usually not subsistence fisheries. They market their catch locally or through intermediaries to distant markets or global markets. Both local and sub-national intermediaries include women and men. However, men often dominate at higher levels of the fish value chains. The globalization of trade creates both opportunities and

risks for small-scale fisheries. In some cases, it puts the decision-making beyond the fisher and those involved in other fishing activities. Global changes in fish trade include increased production and net receipts of foreign exchange in developing countries; increased sale of fish products in fresh, chilled or frozen form as opposed to traditional forms such as salting or drying; increased food safety requirements such as the Hazard Analysis and Critical Control Point (HACCP); and increases in certification and branding based on environmental and/or social criteria.

The key issue is how to link small-scale fishers and traders to market opportunities. The market both provides for and restricts livelihood opportunities for small-scale fishers and traders. The constraints to market access include weak bargaining power and poor marketing strategies, monopolies among wholesalers, poor product holding infrastructure, difficulties meeting quality standards, and lack of market information. With specialized traders, fishers often have little, if any, control over marketing outlets and the prices that they receive. Women producers and traders face additional gender-related barriers including lack of access to credit and technology, increased dependence, as well as a lack of representation in local decision-making related to fisheries and other livelihood opportunities. Low incomes create a situation of potential dependence that influences decisions about credit sources and marketing decisions by the fisher. This dependency becomes a motive for excessive exploitation of the open access resource. Inequalities between fishers and larger traders point to the need to find ways to increase the return received by fishers.

Box 5

Support for Women Fish Traders

African women traders engaged in post-catch handling, drying and selling need: 1) training on the importance of quality control standards and grading, and the need to work in processing "groups" for economies of scale, and 2) assistance with modern technology for efficient drying or smoking.

For example, by Lake Victoria in Kenya, a USAID project is working via the exporter's field agents to educate 400 women wholesale traders involved in the drying and selling of a local minnow called *"omena"* (*Rastrineobola argentea*), which is used for human and animal consumption. To raise sanitary standards, new drying equipment has been introduced by an exporter's agents and replaces sun-drying on ground nets. With an improved product, the women now have a direct linkage to a guaranteed market rather than having to be content with a monopolistic value chain dominated by predatory brokers.

3.2.3 Technological Advances

Technological shifts in small-scale fisheries in the last two decades have dramatically contributed to increased fishing effort. Declining costs of technology have, in some cases, enabled some small-scale fishers, predominantly males, to buy sophisticated equipment such as Global Positioning Systems (GPS), echo sounders, outboard motors and monofilament nets—all of which can improve fishing efficiency, provide access to new fishing grounds, and/or increase market access. At the same time, these technology advances may lead to increased conflicts and overexploitation of some fisheries. Hence,

in some cases management may opt to restrict certain technologies in order to contain overall fishing effort.

3.2.4 Population Growth

Fishing communities often are poor, physically isolated, and have little access to public infrastructure and services including coverage by social services such as population programs. In common with other poor rural populations, their socioeconomic setting usually is conducive to high fertility. Due to the common use of child labor, families with an abundant labor force are at an advantage in the exploitation of open access fishery resources and for diversification of income sources. Rapid population growth, including both intrinsic population growth and immigration to coastal areas, contributes to the increasing overexploitation of natural resources and degradation of the local environment. Further, increasing in-migration—often by young men—frequently leads to social conflicts over allocation and use of resources and other issues. Poor women who migrate to these areas are often vulnerable to further impoverishment and may enter the sex trade or barter sex for fish (see Box 10 on the Integrated Population and Coastal Resources Management program).

3.2.5 Poor Health Infrastructure and Vulnerability to HIV/AIDS

Due to their physical and socioeconomic isolation, many fishing communities often lack adequate sanitation, clean water and health care. In India for example, Chennai coastal communities' rates of morbidity, mortality and illness—particularly among women—are higher than in the rest of the district, as residents live without such basic amenities as clean drinking water, toilets, drainage, or health care. To resolve these issues, both men and women need to be involved in location-specific plans to provide for clean water and adequate sanitation as well as integrated, community-based strategies for health care.

The rates of HIV infection are often quite high in fishing communities, both inland and on the coast. The rates of HIV infection in fishing communities in South and Southeast Asia can be five to ten times higher than those in the general population. **In Thailand, 20% (one in five) of workers employed on fishing boats are HIV-positive, while the general rate in the population is 1.5%. In Africa, female fish mongers can be forced to have sex with a fisher before the man will allow his catch to be purchased, thereby increasing women's vulnerability to HIV/AIDS infection.** The burden of dealing with HIV/AIDS puts stresses on fishing households, particularly women. It prevents them from accumulating assets or spending income to improve household food security. HIV/AIDS is also undermining entire food production systems. Vulnerability to HIV/AIDS in fishing communities comes from the mobility of many fishers; the fact that they have access to a daily cash income in an overall context of poverty and vulnerability; the availability of commercial sex in fishing ports; and the subculture of risk-taking among fishers.

3.2.6 Political and Economic Marginalization

Small-scale fisheries have been systematically ignored and marginalized over the years. In most cases, this was not deliberate but a result of an accumulation of policies and development decisions to "modernize" fisheries. In many countries, the commercial and industrial fisheries have been systematically favored, often to the detriment of both the small-scale fishers and the fish stocks on which they depend. **Major conflicts between the commercial and small-scale sub-sectors have been occurring in different parts of the world, with resulting threats to food security and local economies, and, in some cases, increased violence and even deaths.** In addition, small-scale fishers have been driven out of traditional fishing areas and landing sites as a result of and conflict with tourism, recreational, residential, and industrial development.

Many rural coastal communities have been left behind as economic development has progressed in other parts of the country, furthering economic marginalization. In part, the problem is related to the low priority of rural fishing communities in national economic development planning. In particular, while most rural residents have less voice in national and sub-national planning processes, women's voices and priorities for the fisheries sector are seldom heard due to their lower political and economic status. Women are typically politically and economically un-empowered.

Livelihood development in coastal communities needs to be linked to national economic development plans and to current and future employment needs in the country. Strong economic performance in a country, especially in labor intensive sectors, is important for small-scale fishing communities because it can create alternative employment opportunities. Increases in general economic performance and diversification not only offer the potential for some fishers to leave fishing, but also create a wider range of opportunities to the household.

3.2.7 Gender Inequality

It is common for fisheries projects to lack information on site-specific, sex-disaggregated information on resource use, tenure and knowledge and decision-making. Generalizations about gender and fisheries for entire regions are meaningless and should be avoided, given the wide range of cultural diversity that exists within regions based on ethnicity and religion. For example, Bugis and Christian women, in the same and neighboring communities in coastal North Sulawesi Province (Indonesia), appear to differ significantly in their level and type of engagement in fishing.

In general, gender issues related to fisheries include:

Gender division of labor and income. Women and men in fishing communities tend to engage in different work, and sometimes in different parts of the land/seascape. Men more often fish in offshore areas, whereas women tend to fish closer to shore. Women more often engage in multiple livelihood activities, whereas men often focus on one primary income-earning activity. For fishing households, non-fishing income from

women and men can off-set the increasing unreliability of fishing income and pay for essential household expenses such as food, health and school expenses.

Gendered access to decision-making (representation and advocacy). Women less often have access to formal decision-making about resource management and other topics, at the community, sub-national and national levels. Their interests are often inadequately represented—either it is assumed women's interests are the same as their husbands' or all women's interests are conflated, regardless of differences in economic levels or other social variables. Domestic responsibilities restrict women's availability for community meetings and influence their priorities for investments (e.g., clean water and safe food). When women are invited and are available to participate, cultural norms and a lack of confidence may, nevertheless, leave them inhibited about expressing their opinions in mixed-sex vs. same-sex groups.

Gender-based rights to natural and other resources. Men more often have secure rights to land, water and coastal resources. Both formal and informal tenure regimes and other laws such as those related to inheritance and marriage can impede women's access to and use rights over land. Lack of secure tenure, in turn, creates greater barriers to women's access to credit and services. Both cultural norms and state policies can influence women's access to education and their levels of literacy. At the community level, this influences women's ability to participate in program activities, including capacity-building activities. From a national perspective, educational limitations and segregation of women into a limited number of professions results in fewer women professionals in fisheries. In Muslim cultures, additional restrictions on women's mobility further limit their opportunity to travel and participate.

Gender-based access to markets, market information and trade. Income-earning enterprises usually have some gender division of ownership—with some natural resource-related businesses dominated by one sex and others being mixed-sex. This pattern varies by location. Even if women dominate a specific type of enterprise, they may lack access to the same domestic and international market information as men—because of both literacy and mobility issues. With less access to credit, women have more difficulty scaling-up their enterprises—i.e., expanding their inventories and/or expanding their geographic selling area.

3.3 Ecosystem Change

Unsustainable fishing practices result in direct changes in the structure and composition of aquatic and marine ecosystems, changes that make them less resilient and able to produce food for billions of people worldwide. However, there are also a number of indirect human activities that affect the biodiversity and productivity of fisheries ecosystems. These include pollution from land-based sources as well as habitat degradation and destruction. From a longer-term perspective, anthropogenic climate change is expected to have significant impacts as well.

3.3.1 Habitat Loss, Degradation and Pollution

Coastal ecosystems (coral reefs, mangroves, sea grass, wetlands), upon which many fish species depend for at least part of their life cycle, are degraded and increasingly threatened by human activities ranging from coastal development and destructive fishing practices to overexploitation of resources, marine pollution, runoff from inland deforestation and farming, mining and oil exploration. The currently unsustainable systems of fishing throughout the world are a serious threat to the health of the oceans. While the dynamics of marine ecosystems are still poorly understood, the depletion of one species might have an impact on others. The sea floor is being stripped of their flora and fauna by bottom trawling operations, and marine pollution from coastal cities has also become a significant problem for coastal fisheries.

3.3.2 Climate Change

There is now general scientific consensus that global warming is taking place. One likely result is worsening pressures on marine fish stocks. It is the small-scale fishers, who lack mobility and alternatives and are often the most dependent on specific fisheries, who will suffer disproportionately from such changes. Lowered rainfall in some areas would affect inland fisheries as well as many coastal and estuarine fisheries where rainfall levels and freshwater pulsing is related to fisheries productivity. Sea surface temperatures are also rising and blamed on increasing frequency and severity of coral bleaching events. Acidification of the oceans due to absorption of increasing amounts of human-produced carbon dioxide is also occurring, a factor which will affect the ability of marine organisms like corals, shellfish, sea urchins, and starfish to make their calcium carbonate skeletons and shells. The combined effects of sea surface temperature rise and oceanic acidification could mean that corals will begin to disappear from tropical reefs in just 50 years. In Africa, climate change is a major threat to critical coastal ecosystems such as the Nile, the Niger and other low-lying deltas as well as oceanic islands, particularly in the Indian Ocean, which may be inundated by rising sea levels. The environmental and socioeconomic costs, especially to fisheries communities in developing countries, could be enormous.

4. Issue-Related Opportunities for USAID

This section of the report discusses key approaches and actions to address the priority issues and threats facing small-scale fisheries—weak governance, excess fishing capacity, illegal fishing, poverty and livelihoods, and unsustainable globalization of trade and market access—as discussed in section three. This sets the stage for the following section, which highlights USAID comparative advantage in addressing several of these same issues. This is the basis for the report's final section, which offers recommended actions USAID could take in small-scale fisheries—where the Agency can seize opportunities where its decades of experience may yield a comparative advantage.

4.1 Strengthening Governance

Although there are a number of approaches to addressing the issue of weak governance in fisheries, five approaches will be highlighted here:

- Co-management, including community-based management
- Adaptive management
- Integrated coastal management
- Ecosystem-based management
- Marine protected areas and fisheries reserves

Most of the resource governance strategies described below involve decision-making bodies with varying levels of representation by community leaders or members and civil society organizations. It is important to identify strategies, including quotas, leadership and advocacy training that expand representation of women and women's interests in fisheries governance bodies and in public-private partnerships. While women's organizations have not traditionally focused on fisheries issues, they have important perspectives to contribute if they are educated and engaged in fisheries governance bodies. For example, women's organizations and unions could contribute to dialogue on employment and working conditions for women employees in the fisheries sector. Women's business associations may not have members with fisheries enterprises, but could nevertheless play important roles in improving the business skills of women fisheries entrepreneurs.

4.1.1 Co-Management

Fisheries governance is moving along a continuum from centralized management institutions to more decentralized forms of management, including co-management and community-based management (one of the more delegated and devolved forms of co-management). Co-management is a form of management whereby the government shares power and responsibility for decision-making with resource users (Berkes et al. 2001). Decentralization is bringing about shifts in power and administrative structures. In addition, mechanisms towards improved governance include partnerships with a range of organizations to improve fisheries management, greater stakeholder participation and empowerment of women and men, and downward accountability (processes through

which executing agents or decision-makers are liable to be called to account by their beneficiaries or consumers) (Pomeroy and Berkes 1997).

Resources can be better managed when fishers and other stakeholders are directly involved in their management and when resource use rights are allocated—either individually or collectively—in order to control access. Sharing of fisheries management decision-making and responsibility between government and fishing communities, or co-management, is a concept that has evolved globally in the last decade. The roles of stakeholders can vary so widely that no single co-management "package" can be prescribed. Co-management should not be viewed as a single strategy to solve all the problems of fisheries management, but rather as a process of resource management, maturing and adapting to changing conditions over time, and involving aspects of democratization, social empowerment, gender equality, power sharing, and decentralization. Co-management measures seem to work best in small-scale situations. Larger communities and larger geographic management areas require disproportionately more organization and surveillance. Community-based management is people-centered and community-focused, but requires measures to ensure broad-based and equitable representation, participation and benefit-sharing between men and women, as well as majority and minority groups. At the same time, co-management involves a partnership arrangement between government and the local community of resource users. Co-management has a broader scope and scale than community-based management with a focus both inside and outside the community. Co-management, by definition, includes a major and active government role (Pomeroy and Rivera-Guieb 2006). (This is in contrast to community-based management where the government's role is minor.)

The results of a ten year study of co-management in Asia found that the outcomes of co-management have included:

- improved compliance and enforcement of rules and regulations,
- increased participation of diverse resource users in management,
- improved equity in terms of fair treatment and representation of men and women,
- greater local control over the resource,
- reduced conflicts,
- improved economic conditions for men and women, and
- improved ecosystem health.

The study has shown, however, that the implementation of co-management is costly, complex and long. In addition, an enabling legal, policy and administrative structure from government should support co-management (Pomeroy and Ahmed 2006).

Another major assessment of the success of decentralization and co-management in the African fisheries sector (Lenselink 2002), however, concludes that the approach needs to be rethought. The transfer of responsibilities to local levels of government has not been accompanied by sufficient resources to be effective. Participation by fishers' organizations and groups has been limited by lack of legal recognition and by the absence of strong fishers' organizations. In addition, women have consistently been

underrepresented, even in these organizations and groups. There is nothing in the literature to indicate that a second phase of decentralization and co-management, based on the lessons of the first phase, has begun.

4.1.2 Adaptive Management

Adaptive management and adaptive co-management are processes in which systematic experimentation and monitoring of results and progressive (adaptive) learning is used to improve fisheries management and policy-making. Adaptive management is an iterative process of steps to bring the manager and fisherman closer to desired results whereby successive iterations lead toward progress in reaching established goals and objectives.

There are feedback loops between those engaged in fishing-related activities, fisheries researchers and fisheries managers. Diverse groups of fisheries resource users need to be consulted since both success and failure are subjective concepts and may vary between men and women users, as well as other social groupings. In addition, both men's and women's traditional knowledge about fishing ecosystems can be used to improve conservation and management strategies.

Again, effective learning occurs from not only successes but also failures. The mechanism for institutional learning involves documenting decisions, evaluating results, and responding to evaluation. Institutional learning must be imbedded in both fisheries managers and those engaged in fishing related activities, and the knowledge held by each must be respected and shared (Pomeroy 2003).

4.1.3 Integrated Coastal Management

Integrated Coastal Management (ICM) is a multi-stakeholder process by which rational decisions are made concerning the conservation and sustainable use of coastal resources and space. The process is designed to overcome the fragmentation inherent in single-sector management approaches, in the splits in jurisdiction among different agencies and levels of government, and in the land-water interface. ICM does not replace single-sector resource management, such as coastal water quality management and fisheries management, but rather aims to ensure their activities function harmoniously to achieve agreed water quality and fisheries goals. Countries throughout the world have supported national-level ICM programs (Christie 2005; Cicin-Sain and Knecht 1998; White et al. 2005; Cicin-Sain and Knecht 1998) and mandates for using ICM approaches are prominent in, among others, the Agenda 21 of the United Nations Conference on Environment and Development, United Nations Convention on the Law of the Sea, Convention on Biological Diversity, and Intergovernmental Panel on Climate Change.

4.1.4 Ecosystem-Based Management

Conventional fisheries management focuses on a single species or stock and generally assumes that the productivity of that stock is a function only of its inherent population characteristics. Following this model, fisheries management has been, at best, only

partially successful. Major problems have emerged due to uncertainty of the status and dynamics of the stock; a tendency to give priority to short-term social and economic needs versus long-term sustainability of the stock; and poorly defined and often conflicting objectives and institutional weaknesses.

To address these concerns, discussions of marine ecosystems now recognize that these systems are composed of both natural and human elements. Fish populations are one portion of complex marine ecosystems that are affected by many natural and human-induced factors. In turn, fisheries should be considered as systems in which social systems and ecological systems are, in fact, linked. This perspective calls for a new way of managing fisheries—specifically, ecosystem-based approaches. An ecosystem-based approach to fisheries management is geographically specified fisheries management, an approach that takes account of knowledge and uncertainties about and among living marine resources, their habitat, and human components of ecosystems, and strives to balance diverse societal objectives. The aim is to ensure that, despite variability, uncertainty and likely natural changes in the ecosystem, the capacity of aquatic ecosystem health, both natural and human, is maintained indefinitely for the benefit of present and future generations. EBM, while a logical extension for previous ICM efforts, represents a considerable governance challenge in many countries (Christie et al. in press).

4.1.5 Marine Protected Areas and Fisheries Reserves

Certain types of marine protected areas (MPAs) provide opportunities for protecting fish populations and the habitats upon which they depend. The most frequently used definition of an MPA is provided by the World Conservation Union (IUCN) as “any area of marine environment that is reserved by law or other effective means to protect all or part of the enclosed area” (Kelleher, 1999). MPAs can reduce conflicts between fishers and other users by providing areas where non-fishery users can pursue non-consumptive uses of the resources. MPAs can also help in diversifying the coastal economy through tourism and conservation work. Marine protected areas come in many types, shapes and sizes. Around the world, they encompass everything from small, locally managed marine areas established by coastal communities to help conserve dwindling marine resources, to sites of cultural interest, to vast multiple-use areas that have a range of conservation, economic, and social objectives. Recently, additional attention is being given to establishing regional ecological networks of MPAs to conserve biodiversity and protect fish stocks.

One of the more restricted forms of MPAs is a no-take area or fisheries reserve—a spatially defined area in which all extractive activities are prohibited. One purpose of a fisheries reserve is to protect target species from exploitation in order to allow their populations to recover. Perhaps more importantly, fisheries reserves can protect entire ecosystems by conserving multiple species and critical habitats such as spawning areas and nursery beds. Stocks inside the reserve provide insurance against fluctuations in and the depletions of populations outside the protected area caused by mismanagement or natural variability. Fisheries reserves provide important fisheries enhancement functions,

which include adult spillover from reserves to adjacent fishable areas, and enhanced larval export to open areas from increased spawning stock size and biomass inside the closed area. Local ownership and participatory development of rules, by both men and women resource users, are essential factors in the sustainability of MPAs. When the resource rights of women or specific other stakeholders have been ignored, MPAs have been less successful (World Bank 2006).

4.2 Reducing Excess Fishing Capacity

The problem of reducing excess capacity in small-scale fisheries in developing countries is much more complex that that of reducing overcapacity in industrial fleets. The complexity in small-scale fisheries is compounded by such factors as growing human populations, sluggish economies, and a high dependence of fishers on the resource for food and livelihood. The issue is further complicated by a paucity of non-fishery employment opportunities, an increasing number of part-time and seasonal fishers, and limited transferability of capital and movement of labor.

Conventional approaches for reducing excess fishing capacity in industrial and commercial fisheries in developed countries are not well suited for small-scale fisheries. Such approaches include vessel buybacks and fishing rights schemes such as individual transferable quotas (ITQs). In developing countries, funds for vessel buybacks are typically lacking, and monitoring and control systems needed for ITQ schemes are weak. Policies that reduce the number of fishers in small-scale fisheries without creating non-fishery employment opportunities also are not viable, as the fisher will merely fish illegally, obtain a new boat and gear, or do whatever else is necessary to continue making a living to feed the family. Fishers and their families need a broader range of options both to support exit from the fishery livelihood and to reduce the household's economic dependence on the fishery. A number of other more promising approaches to reducing excess capacity in small-scale fisheries are outlined below.

Box 7

Challenges of Reducing Capacity

African coastal countries, with very few exceptions, have not responded to the primary challenge of reducing capacity in their industrial and small-scale fleets. The FAO International Plan of Action on Overcapacity (IPOA) has been accepted by most African countries, but only Namibia and Senegal have begun to develop such a plan, and Mauritania has requested assistance for doing one, according to the FAO Fisheries Department which monitors implementation of the IPOA.

4.2.1 An Integrated Livelihoods Approach

Given the realities outlined above, the only feasible solution to excess fishing capacity may be an integrated approach that considers resource management along with economic and community development. This approach finds solutions to the problem of excess capacity in both the fishery sector and non-fishery economic sectors. The approach is innovative and must utilize new measures such as property rights and licensing to control

access and ecosystem-based measures such as marine protected areas—i.e., it must go beyond the commonly used solution of giving "pigs and chickens" to fishing households to raise and sell for supplemental income or as an "alternative" livelihood.

The integrated livelihoods approach recognizes that solutions involve both the individual fisher as well as other household adults who directly or indirectly rely on the fishery for their livelihood. There must be consideration of not only resource management, but of broader economic livelihood issues—e.g., strategies to address household food security, employment, income and livelihood as well as gender-based differences, barriers and opportunities. The approach requires understanding the differences among and within fisheries-reliant communities. It also requires understanding how men and women adapt to reduce their risks, the incentives that drive resource users' decisions and behaviors, and the sources of vulnerability to stresses and shocks. It requires addressing fundamental social, economic and environmental reforms that affect individuals, households and communities. Solutions involve stronger linkages between coastal fishing communities and regional and national economies, and recognize that solutions are found both inside and outside the fishing community. The active participation of people in this approach, through a strategy of co-management, is mandatory in planning, formulating, and implementing development and management activities.

4.2.2 Building Political Will

Governments often fail to act on addressing excess fishing capacity because the solutions are complex and because there is great political sensitivity around some of the actions required (ultimately forcing people out of fishing and into other occupations, as well as addressing population growth). Yet, there is a need to tackle the issue of the lack of political will to restructure fishing fleets. There is a need to support processes of building consensus for capacity reduction plans. There is the need to address the difficult problem of shifting to property rights or user rights in fisheries management—the only way fishing capacity can be effectively reduced.

4.2.3 Controlling Access

As mentioned above, access control will be a major approach to addressing the issue of excess capacity in small-scale fisheries and can be undertaken through adoption of fishing or user rights. Coastal areas frequently attract the poor, offering a range of easily-accessible livelihood opportunities often unavailable in inland areas. The poor exploit a range of resources from both the land and sea with a range of harvesting methods. One reason the poor are attracted to these resources is that they are 'open access' and are easily exploited with minimal capital resources. Yet, the open access nature of these resources also makes them particularly vulnerable to overexploitation. Open access creates an increasingly competitive environment amongst users—where access to the resource upon which they depend is becoming increasingly limited. Access control measures such as establishing marine protected areas and/or instigating territorial use rights and community ownership—approaches increasingly used to conserve and protect these resources—may also put further limits on access.

The land and sea tenure status of entire coastal communities, households and men and women is often based on custom rather than being legally established under modern law. The poor are often least able to defend their livelihoods or to establish legal tenure rights over the resource. Women are particularly disadvantaged in this respect. **Both poor men and women need tenure security rights over the resources upon which they depend in order to make long-term investments in sustainable livelihoods and resource management. Tenure rights also encourage resource users to optimize the use of and ensure the conservation of resources**. As fisheries have developed over the last four decades, most countries have increased the role of the national government in managing fisheries with a corresponding decrease in local levels of traditional management and control.

As mentioned above, small-scale fishers are especially vulnerable and states should protect the rights of these individuals and households to a secure and just livelihood by granting them preferential access to traditional fishing grounds and waters. This means governments may need to extend the areas that are reserved for exclusive exploitation by the small-scale fishers in order to protect them from industrial fleets.

Box 8

What are Marine Extractive Reserves (MERs)?

"MERs are a community-based, site specific, multi-use, land and sea resource management approach based on claims of culturally distinct groups with longstanding livelihood ties to "artisan-scale" production territories…

MERs are essentially an effort to modify and extend the concept of land tenure rights and extractive reserves—a conservation and sustainable development framework successfully instituted in western Amazonian forest economies—to coastal aquatic and marine domains of traditional fishing communities.

At the local level in the Latin America and Caribbean region, local marine tenure provides some incentive for sustainable management and is in line with USAID's interest and experience with improving governance. For example, the Brazilian fisheries agency is establishing marine extractive reserves (MERs). Currently, 28 MERs in nine Brazilian states stretching from Para to Santa Catarina encompass 735,000 hectares of sea space and include approximately 40,000 artisanal fishers. An additional 68 MER proposals are being considered by the Brazilian Environment Agency (IBAMA) for strategic sites in 15 of Brazil's 17 coastal states…" (World Bank 2006).

In Chile, 453 areas have been legally established, which grant exclusive access to local fishers and which monitor and limit total allowable harvest/catch of valuable invertebrates (World Bank 2006). Similar efforts are underway in the Sea of Cortez in Mexico. In these cases, national and local policies are granting secure marine tenure for local fishers as a means to close "open access"—a key first step toward sustainable fisheries. While these systems devolve control of marine resources to communities, additional strategies are needed to ensure that benefits are distributed equitably within

these groups and between men and women. These efforts should be expanded to other contexts with the appropriate monitoring efforts in place.

4.3 Improving Information for Decision-Making

A primary cause of weak governance in small-scale fisheries is the lack of knowledge and information about the sector. Conventional fisheries information systems that have been developed mainly for "northern" fisheries systems are poorly suited for small-scale tropical fisheries sector due to the multi-species nature of the fisheries, large number of fishers, numerous dispersed landing sites, and high proportion of total capture fisheries consumed locally that do not enter commercial market chains. Basic demographic and technology information is needed for policy and management on the number and sex of small-scale fishers and their households, number and variety of boats and gear, demographic and catch information on gleaners, livelihood and occupational structure for men and women, location of operation, and annual catch and sex-disaggregated data on post-harvest fisheries activities, including unpaid labor, employment and enterprise ownership. Expanded collection of sex-disaggregated data for fisheries will enable countries to determine both women's contributions to the fisheries sector, as well as national and sub-national resources spent to improve women's employment and enterprise income from fisheries-related activities. Increased availability of sex-disaggregated information will increase the relevance of proposed policies and avoid negative impacts on women's economic or political status or their access to resources.

For small-scale fisheries, limited resources dictate that information gathering and management needs to be efficient. Information must be acquired and managed in the context of a plan with a clear view of how it will be used in policy and management. Information systems need to be low-cost, have low data requirements, and be easy to obtain. Rather than focus exclusively on male boat fishers, fisheries statistics need to provide a more complete picture of the involvement of both men and women in the fisheries sector and value chains. Information also needs to have carefully planned communication strategies to get information to policy makers in an efficient manner. Rapid appraisal techniques have been developed that provide alternatives to the conventional sampling and census-based methodologies that dominate scientific research. Rapid appraisal allows for the quick acquisition of key information, which is perceived as essential to management decision-making. Fisheries regimes that are less data intensive and, therefore, considered more appropriate from an information standpoint as well as for easier enforcement include application of territorial use rights in fisheries and no-take marine reserves.

4.4 Preventing Illegal Fishing

At the core of addressing illegal fishing, are improvements in enforcement of and compliance with laws and regulations. The inability to enforce regulations in the field—the very regulations which made perfect sense in the meeting room—has been the downfall of many fisheries, both large and small-scale. Compliance with regulations is particularly difficult when those regulations have been formulated with little or no

participation by stakeholders. This lack of opportunity to participate reduces the fishers' perceived legitimacy of these same regulations. This in turn leads to the need for greater reliance on active surveillance and patrolling as a deterrence measure. Further, small-scale fisheries with large numbers of fishers widely dispersed in inaccessible places are particularly resistant to top-down enforcement.

Fisheries are regulated in order to mitigate overexploitation and conflicts among user groups. For example, overfishing that results from open access to the fishery is often addressed with regulations restricting gear and vessels, setting minimum fish size limits, implementing time and area closures and quotas, and requiring fishers to have licenses. User conflicts are often addressed with regulations that prohibit certain gear or that create zones to separate out user groups. Fishing with explosives is addressed through a combination of prohibition and patrols and surveillance. Frequently, the most costly element of fisheries management programs is enforcement—accounting for a 25-50% of all expenditures. In spite of this cost, compliance with regulations is usually far from complete and seriously jeopardizes the effectiveness of management. This raises questions about ways to improve the cost-effectiveness of traditional enforcement and ways to secure compliance without such heavy reliance on enforcement in the first place.

In small-scale fisheries, enforcement is often closely linked with issues of rural development and unemployment. Given this and the considerations in the previous paragraph, it is believed that most small-scale fisheries need a radically different approach to enforcement and compliance. Recent studies indicate that several factors determine compliance by small-scale fishers: potential illegal gain; severity and certainty of sanctions; an individual's moral development and his or her standard of personal morality; an individual's perceptions of how just and moral are the rules being enforced; and the social environment. Research shows that an individual's moral development is a more important factor than is that individual's perceived legitimacy of the regulation when it comes to compliance. Thus, the new approaches tend to focus on developing stakeholder consensus and involvement in management. This is a lengthy process that requires the manager to have not only technical skills but also skills in mediation, facilitation, and education. The underlying assumption of this approach is that when the stakeholders understand the problems and the benefits of taking action, and agree upon the actions to be taken, they will also take part in the enforcement—at least to the extent of encouraging compliance. In a co-managed fishery, there is an even greater moral obligation on individuals to comply with rules and regulations, since the fishers themselves are involved in formulating, rationalizing, and imposing the rules and regulations for their overall well-being (Kuperan 1992; Berkes et al. 2001).

4.5 Alleviating Poverty and Diversifying Livelihoods

The status of many fishing communities in the developing world can at best be described as fragile. With a high dependency on a severely depleted and overfished natural resource base and on badly degraded ecosystems, few fishing communities in the developing world have found sustainable paths out of poverty. There is a need to address the root causes of vulnerability of fisher men and women and their communities and to build

resilience to cope with future threats as well as build the capacity to exploit opportunities that may present themselves in the nearer term.

Addressing issues of poverty and livelihoods in fishing communities must be undertaken through a process of change that addresses the recurrent factors that make men and women vulnerable. Some of these factors can be addressed more immediately. Others, such as equity, power relations, access to resources and markets, asset ownership and sustainability of resource use, are more fundamental and require more time. In both cases, addressing the root causes of vulnerability requires integrating consideration of social, economic, and ecological factors. Social development requires looking at issues around empowerment, community organization, education, training, family planning, secure resource tenure and access. Economic development considers job creation, private sector investment, equitable market access, microfinance, and integration into the national economy. Ecological interventions look at protecting and rehabilitating coastal habitats, and implementing coastal resource management.

Box 9

Sustainable Livelihoods Approach (SLA)

An example of addressing poverty and livelihoods in small-scale fisheries is the sustainable livelihoods approach (SLA). The SLA puts people, particularly the poor, at the center of development. It brings together some of the good practices in participatory development in the perspective of people's complex livelihoods in order to achieve sustainable development. For example, the Sustainable Coastal Livelihood project in India, Sri Lanka, and Bangladesh, aimed to identify and promote policy processes that support the development of sustainable livelihoods for the poor in the coastal communities of South Asia. A fundamental dimension of the SLA is attention to the complex livelihood strategies, as well as a more complete understanding of both income and expenditures by men and women.

Since not everything can be done simultaneously, a process for prioritizing actions must take into account issues around both staging and scale. What actions are feasible now and which can address more fundamental problems over the longer term? What can be done at the local community level and what challenges are more systemic and require policy or institutional changes at national or even international levels? Experience highlights the need to phase-in interventions over time and to set realistic expectations.

It is important to stress that there is no single blueprint approach. Depending on situation and context, different processes can be used to address poverty and coastal livelihoods. What is vital is that the process be well planned at the operational level and be participatory—involving consultation and collaboration with both men and women and the diverse social and resource user group(s) within communities. Recognizing that short-term, uncoordinated action can be detrimental to sustainable long-term results, it is also vital that any process be grounded in a longer-term strategic plan. Whatever the process of planning, implementing and evaluating the livelihoods, it is necessary to repeatedly evaluate a range of options and update information. In practice, assessing more immediate options inevitably points to underlying constraints in the local livelihood context as well as opportunities to address these problems over different time periods and

at various scales. Key criteria for assessing livelihood options include: social feasibility, technical feasibility, institutional sustainability, and the supporting infrastructure and policy environment.

Fishing still attracts the poor and landless in many countries. Here, a project that is successful in raising small-scale fishers out of poverty through alternative livelihoods will only create a vacuum that will be filled by a flood of new entrants. In other words, if the present fishers move up a step from the bottom rung of the socioeconomic ladder, the bottom rung will be filled again. Therefore, in those countries where this sub-sector remains at the bottom of the ladder, the whole ladder has to be raised. In such situations, there can be no economic progress for poor fishing communities in open access regimes unless the national economy is improved—in an equitable way. In these circumstances, controlling additional entrants to a fishery through user rights, tenure and other access control is essential, but politically difficult—unless there are economically attractive incentives for fishers to permanently exit the fishery. In situations where high population growth rates may also be a driving force in pushing more and more individuals into fishing/overfishing, it may be appropriate to incorporate family planning activities along with alternative livelihoods activities.

Box 10

Poverty, Population and the Environment

It is widely recognized that a key component of addressing poverty is allowing families access to family planning. In 2002, USAID initiated its Population-Health-Environment (PHE) Program for family planning/reproductive health, "***including in areas where population growth threatens biodiversity or endangered species***." This speaks to the reality that one-sixth of the world's population lives in areas with delicate ecosystems and high biodiversity known as ecological "hotspots". This includes in the Philippines, where USAID is supporting the Integrated Population and Coastal Resource Management (IPOPCORM) Program, which targets communities in endangered coastal reef areas and helps them protect and manage the reefs, provides them with family planning education and access to contraceptives, and encourages fisherman and their families to pursue other livelihoods through training and access to microcredit.

IPOPCORM raises community understanding of the direct links between food shortages, over-fishing, and large families and trains the community in alternate solutions for income generation (by switching from fishing to seaweed farming, some community members are earning the same income in the same amount of time and yet are also helping reduce the problem of over-fishing.) The Program also carefully monitors the separate and synergistic impacts of various reproductive health and coastal management interventions.

While fisher-focused activities are likely to largely benefit men, women are more likely to benefit economically from economic growth activities that improve women's participation at different levels of fisheries value chains. Women's fisheries businesses include fish drying and salting (small-scale and industrial processing), transport and

selling. To initiate and expand their role in local, national and international markets, women entrepreneurs (micro, small, medium and large-scale) require business development services (i.e. credit, technology, extension, market information) and food safety certification training.

4.6 Promoting Fair and Sustainable International Trade and Market Access

New approaches to improving the environmental sustainability of fisheries have included the certification of fisheries harvested by sustainable means, the eco-labeling of fish and seafood products from certified fisheries, as well as reform of the aquarium fish trade through net training to stop cyanide use, and assistance in development of new markets and alternative livelihoods. The intention is to use the power of markets as an incentive to induce more sustainable fisheries. To date, only a relatively small number of fisheries have been certified, predominantly in developed countries. Developing country critiques of eco-labeling, as currently formulated, focus on five areas: a) legitimacy and credibility; b) a mismatch between certification requirements and the reality of tropical small-scale fisheries; c) potential distortions to existing practices and livelihoods; d) equity and feasibility; and e) perceived barriers to trade.

Certification of small-scale fisheries is made difficult due to some of the data requirements of the current application of the process. Where larger industrial fisheries are data rich, there is usually little, if any, data on small-scale fisheries. To address this, the Marine Stewardship Council (MSC), World Wildlife Fund (WWF) and others have been working with small-scale fisheries to use alternative methodologies for certification.

Box 11

A Certified Small-scale Fishery

The Baja California spiny lobster fishery made history by becoming the first small-scale community fishery from a developing country to become certified. This fishery had to address both data gaps and political obstacles on their path towards MSC certification. They were successful in large part due to the will and determination of the ten communities that make up this fishery.

The MSC's ongoing "Developing World Program" aims to make certification more accessible for these fisheries. It involves drafting of guidelines for the assessment of small-scale and data deficient fisheries. These guidelines are currently in the desk-top analysis phase. There are plans for pilot fisheries trials in early 2007, which involve introducing risk assessment mechanisms into the current certification process so that, for example, fisheries with limited data, but which are managed through a precautionary approach, can be recognized.

The WWF's "Community Fisheries Program" applies a tailored methodology for certification that is better suited for developing world, small-scale fisheries. Since beginning this work with community fisheries, the program has grown to include 15 projects worldwide. The fisheries involved range from artisanal community fisheries in developing countries to larger-volume fisheries in developed countries where the unit of fishing is still small boats with only a few crew members. The Community-based Certification Program has learned a number of important lessons about applying MSC

certification to small-scale fisheries. One of the most important is that many community fisheries can use the process of certification to address significant issues within the fishery. The resulting environmental, social, and political benefits are often as equally important as the potential market benefits of certification. The Community Fisheries Program refers to these as “the hidden benefits of certification.”

The effects of globalization on market access for small-scale developing country fisheries can be addressed in part through the continued development of tailored certification programs. Yet, simply relying on export markets alone will not provide a durable solution to problems with small-scale fisheries. A key element of any community fisheries program will be the development of local control and capacity to manage resources effectively. Partnerships with the private sector and NGOs should encourage those programs that build sustainability from the ground up. Donors play a central role with convening influence. USAID could extend its experience in private-public sector partnerships to the fisheries realm

5. USAID Comparative Advantage in Fisheries

5.1 USAID Assistance Supporting Sustainable Fisheries Management

USAID has a long-standing track record in freshwater and marine conservation and resources management throughout the world. With a few notable exceptions (e.g. FISH Philippines and MACH Bangladesh), most efforts have not had fisheries management as a central program objective. Most initiatives, both past and present, have contributed in ancillary ways to fisheries management through goals focused more on aquatic and marine biodiversity conservation, natural resource, or coastal management. It should be noted that given these caveats provided above, USAID has made significant and noteworthy investments and contributions to sustainable fisheries worldwide. However, the Agency does not seem to have made any specific policy commitments to reform of the fisheries sector nor has it outlined a specific approach or strategy towards this sector. For example, capture fisheries have not been supported under Agriculture, Economic Growth, or Trade programs at USAID despite the importance of this sector to food security, economic growth, livelihoods and trade; also, the model presented by the innovative MACH program in Bangladesh, which linked Title II funding with natural resources management, has not been utilized further by the Food-For-Peace Office. This section provides a brief overview of USAID past and current program approaches that have supported sustainable fisheries management directly or indirectly. This history of involvement provides insights into how the Agency could formulate a more explicit strategy for the fisheries sector.

5.1.1 USAID Approaches Contributing to Fisheries Management Objectives

"USAID supports many projects and programs that seek to improve management of water and aquatic ecosystems for the conservation of biodiversity and for their provision of services essential to human development" (USAID 2005: 2), including fisheries. Based on an understanding of ecosystem function and specifically how society interacts within the ecosystem, "USAID has adopted an integrated approach to its programming. **Integrated Water and Coastal Resources Management** (IWRM), an approach promoted by USAID, recognizes that water and coastal management must be approached holistically." (USAID 2005:2)

This USAID programming approach is consistent with global experience over the past several decades. For instance, **integrated coastal management** (ICM) has gained considerable momentum across the globe as the preferred approach to deal with issues of sustainable development and marine resource protection in coastal areas. In addition, a **large-scale ecoregional or landscape approach—**which includes addressing regional economic and ecological issues—has emerged as critical for biodiversity and habitat conservation. USAID promotes both integrated coastal management and large-scale seascape/landscape approaches to site-based conservation and management. The Agency also recognizes that sound management of coastal resources must be at the forefront of sustainable development in coastal areas. USAID, through its conservation and natural resources management projects, promotes the essential elements of sustainable

development—protecting the world's environment, fostering balanced economic development, promoting democratic participation in governance, and improving the health and well-being of people in the world's developing nations.

Integrated Watershed Management is another approach used by USAID that contributes to sustainable freshwater and marine fisheries management. Success requires forging the right balance between competing human uses of water and natural resources, while ensuring that natural "assets", such as environmental health and productivity, are not compromised in the long-term. For example, in **Jamaica**, the "*Ridges to Reef*" watershed management effort is integrated with activities in wastewater and sanitation management, improved land use, and sound coastal tourism. In addition to Jamaica, major watershed management projects are supported in the Central American, Caribbean and Southeast Asian regions.

Coral reef and mangrove ecosystems are essential fish habitat and make significant contributions to fisheries exports and food security, as well as provide many other ecological services and values. USAID's activities directly support **coral reef and mangrove forest conservation** in over 20 tropical countries throughout the world. Activities range from field programs in best management practices and monitoring, to the establishment and improvement of marine parks and reserves, to improvements in coastal tourism and fisheries management, to ICM and larger seascape approaches.

Management of **marine protected areas** and management of fisheries reserves are other approaches supported by USAID that have sustainable fisheries benefits. One especially effective management approach is the establishment of a series of ecological "no-take" reserves and/or multi-purpose marine protected areas that can result in early and sustained management dividends. Ecological reserves improve fishery yields and help build and maintain healthy fish populations. Ecological reserves have also proven very effective in the conservation of marine biodiversity and the generation of jobs and revenue through tourism.

5.1.2 USAID Experience: Past and Present

It is difficult to sort the many USAID projects and initiatives into particular categories such as conservation, natural resources or fisheries management, as many have dual objectives. The intent is to provide a fairly extensive overview, rather than an exhaustive listing, of what the current and past portfolio of USAID experience contributes to sustainable fisheries management. Projects are sorted as either freshwater-oriented or marine and coastal.

<u>Freshwater Initiatives</u>

In the freshwater realm, the USAID focus is on major riverine systems in South Asia, Africa, and Latin America. They include national, regional and global scale initiatives.

At the national level, USAID is active in **Malawi** and the conservation of Lake Malawi through the *Community Partnership for Sustainable Resource Management in Malawi* program (COMPASS). Phase I was implemented in 1999-2004 and Phase II is ongoing. The focus of this effort is community-based natural resource management with added emphasis on watershed management, protected areas, and high value natural products.

In **Bangladesh**, a partnership among community organizations, government and non-governmental agencies, and USAID initiated the two-phase *MACH (Management of Aquatic Ecosystems through Community Husbandry)* project. The project has focused on sustainable wetland resource management at the ecosystem level with an emphasis on conserving critical fish resources. In the Ganges-Brahmaputra delta, over 110 villages inhabited by more than 184,000 people were directly involved and another 300,000 people benefited. About 125,000 trees were planted to restore natural swamp forest and about 480,000 planted to stabilize river and stream banks. No-take fishery reserves were established to protect and grow critical fish populations. Additionally, the Bangladesh government has designated eight "national" sanctuaries permanently set aside to protect wetland biodiversity. These sanctuaries will be managed by community organizations.

Box 12

Addressing Inequalities in Livelihood, Literacy, Leadership and Representation

Despite significant gender inequalities, the MACH project ensured that Bangladeshi women living in wetland areas received credit, participated in awareness-raising sessions on socio-economic and life-oriented issues, and received training in leadership and adult literacy.

More than 1,500 women and their families directly benefited from the increased fish yields brought about through their own conservation efforts. MACH committed to the inclusion of 25% female members in the Resource Management Organization (RMO) General Bodies and 20% female participation in the RMO Executive Committees. In 2006, MACH included an additional 240 women in Resource User Groups (RUGs) and some of these women will be incorporated into the resource planning organizations that are increasing fish yields through conservation.

To improve the quality of their participation and enterprise success, the MACH II supported leadership training for an additional 350 women and another 620 women received adult literacy training. MACH provided 25% of all large enterprise loans to female RUG members.

An innovative component of the MACH project was the linkage of Title II Food for Peace and Natural Resource Management projects to improve capture fisheries management and reduce food insecurity. While sustainable agricultural and aquaculture practices have been extensively supported under Title II and Food for Peace programs, the MACH project demonstrated that capture fisheries have a vital role to play in food security programs.

USAID has also invested approximately US $4 million dollars in the restoration of Iraq's Mesopotamian Marshes (USAID 2005). This area is the largest wetland ecosystem in the Middle East. Efforts there have included improving agriculture and livestock production systems, health care improvements, restocking native fish, and designing community-level constructed wetlands to manage sewage and improve water quality.

USAID has supported and continues to support watershed conservation in various Central American countries including **Honduras**, **Nicaragua**, and **Panama** with an emphasis on protected areas, sustainable livelihoods, planning, reforestation, and institutional strengthening.

At the regional scale, efforts are focused in Africa and in the Amazon Basin:

The Regional Center for Southern Africa (RCSA) supports natural resource management efforts with a focus on transboundary areas including the Limpopo Transboundary Natural Resource Management Area in **South Africa**, **Mozambique**, and **Zimbabwe**; the Four Corners in Botswana, Namibia, Zambia, and Zimbabwe; and the transboundary area linking Zimbabwe, Mozambique, and Zambia (ZIMOZA). Recent work has focused on strengthening institutions working on natural and river basin resources management. Planning and livelihood development are key elements of these programs (USAID 2005). USAID/RCSA in conjunction with USAID/**Namibia** has also supported transboundary fisheries management activities in the Zambezi/Chobe River system. USAID/**Namibia** has piloted stakeholder-based fisheries management initiatives in partnership with WWF.

The Central Africa Regional Program for the Environment (CARPE) is a three-phase 15-year program focused on the conservation of Africa's largest area of rainforest in the Congo River Basin. USAID supports consortia of partners in developing and implementing appropriate management plans in 12 "landscapes"—areas selected for their critical conservation value. CARPE has succeeded in marshalling funds from other donors as well, with the development consortia encouraged to find "match" for the USAID funds (approximately US $50 million per five-year phase). During the first phase (2001-2006), fisheries received relatively little attention, but are expected to be given more emphasis in Phase II, including supporting fishing activities by men and women from indigenous forest peoples.

The Amazon Basin Conservation Initiative (ABCI) supported by USAID, involves conservation efforts in **Bolivia**, **Brazil**, **Colombia**, **Ecuador**, and **Peru**, with programs totaling approximately US $36 million annually. Emphasis has been on planning and development at the landscape scale, thereby addressing protected areas, river corridors, and private or communal lands as an integrated system. Overfishing is recognized as an ABCI priority threat due to its contribution to habitat conversion or degradation. Management of freshwater and forest resources is also identified as an ABCI Priority Opportunity. ABCI has programs to Build Conservation Consortia in the region, and Support Program Management and Facilitate Regional Collaboration for Conservation.

At the global scale, the *Global Water for Sustainability (GLOWS)* program is a new USAID global initiative. It is a consortium led by Florida International University that is working to increase social, economic, and environmental benefits to people of the developing world through clean water, healthy aquatic ecosystems, and sustainable water resources management. Launched in early 2005, GLOWS works on-the-ground to implement improved practices, builds local capacity through multi-level training activities, and shares lessons learned and advancements in integrated water resources

management (IWRM) practice with local and global partners. The program includes three key elements:

- Strengthening cooperative governance and strategic decision-making
- Supporting innovative and sustainable technical interventions including fostering sustainable fisheries, aquaculture and aquatic ecosystem protection
- Fostering global learning and local capacity-building in IWRM

GLOWS focuses on fisheries and aquaculture in freshwater systems. In the Pastaza River Basin in Peru, GLOWS is working with regional authorities and indigenous community organizations to improve the livelihoods of native people while protecting the area's ecosystems through the proper and sustainable management of their fisheries resources.

Marine and Coastal Initiatives

Beginning in the early 1980s, USAID invested in several fisheries development, technical assistance, and applied research programs. For instance, the University of Rhode Island's (URI) International Center for Marine Resource Development (ICMRD) implemented a three-fold program of information services, advisory and consultant services, and training. The University of Washington, University of Maryland and URI were involved in various fish stock assessment programs. These efforts, which involved U.S. and foreign universities, resulted in groundbreaking research on fisheries stock assessment, fishing societies, and institutions. Various field projects in Indonesia, Panama, the South Pacific, West Africa and elsewhere focused on fisheries development and, to some degree, fisheries management.

By the late 1980s, perhaps with the realization that fisheries were beginning to show signs of overexploitation, integrated coastal management (ICM) and marine conservation began to emerge as the principal paradigm of USAID support in the marine realm. While these projects had a broader mandate, each worked to improve the management of important fisheries resources. They improved coastal management primarily through zoning schemes, marine protected areas, education, and human and institutional capacity development. Today, USAID is recognized as a global leader in ICM.

In the recent past, USAID supported large ICM programs in **Ecuador**, **Indonesia**, **Kenya**, **Mexico**, the **Philippines**, and **Tanzania**. Presently, USAID is supporting coastal governance programs in the **Philippines** and **Tanzania**. USAID is also supporting biodiversity conservation in several marine ecoregions of global significance—the East African Marine Ecoregion (**Kenya**, **Tanzania**, **Mozambique**); the Meso-American Reef region (**Mexico**, **Belize**, **Guatemala**, **Honduras**); the South East Asian Coral Triangle (**Indonesia**, the Philippines and Papua New Guinea); and the Caribbean (**Jamaica**, **Dominican Republic**, **St Vincent** and **the Grenadines**). All of these programs have a strong focus on fisheries management. In the recent past, USAID supported programs in the Pacific to address overfishing in the live reef food fish trade, and protect spawning aggregations through the *East Asia and Pacific Environmental Initiative*.

USAID is currently supporting marine protected areas, fishery reserves, and marine national parks of regional and international significance in **Indonesia**, the **Philippines**, **Papua New Guinea**, **Egypt**, **Kenya**, **Tanzania**, **Mozambique**, **Dominican Republic**, **Ecuador**, **Brazil**, **Dominican Republic**, **Honduras** and **Mexico**, as well as several in transboundary sites. Some of these parks are included in the *Parks-in-Peril Program*, a regional protected area management program in Latin America and Caribbean.

Marine protected areas (MPAs) represent an important dimension of USAID's biodiversity conservation portfolio. The Agency supports large-scale marine conservation programs in the Meso-America Reef Ecoregion, the Eastern Caribbean, South America, the Middle East, Southeast Asia and Eastern Africa. USAID promotes a threat-based approach to biodiversity conservation. Thus, these conservation programs address the threats to marine biodiversity from overfishing and destructive fishing, and view fishery reserves (MPAs) as integral components of sustainable fisheries management. Marine protected areas have frequently been linked to, or are a part of, other integrated coastal management programs.

USAID national level programs include:

In **Jamaica**, the *Ridge to Reef/Watershed Project* and *Coastal Water Quality Improvement Project* focused on watershed conservation, sustainable agriculture, reforestation, water quality and coral reef management, and education.

USAID, working with various partners, has supported conservation activities in the Galapagos Islands in **Ecuador**. As part of this effort, the Agency has provided technical assistance and training in how to develop low-impact community-based ecotourism as an alternative to destructive over-fishing. It has also provided training in conflict resolution while gaining the broader engagement of stakeholder groups, including the commercial fishing sector. In addition, USAID's support to the Charles Darwin Foundation has provided the scientific basis for key management tools to protect the Galapagos Marine Reserve. These tools include a fishing calendar, regulations (including catch limits) for lobster and sea cucumber fishing, a moratorium on new fishing permits, and a proposal for zoning the Reserve.

In **Mexico**, the USAID-funded *Coastal Resources Management Program* (CRMP II) worked with fishers and the Xcalak community in the Yucatan Peninsula to develop a marine park plan which included opportunities for fishers to move from fishing to dive tourism to reduce fishing pressure, and also established no-take zones within the park. Other CRMP activities in Mexico significantly improved women's livelihoods via production of new commodities from shrimp heads and improved their participation in resource planning.

In **Papua New Guinea**, USAID is supporting the Kimbe Bay/Bismarck Sea ecoregional programs with the goal of establishing networks of MPAs to conserve biodiversity and manage fisheries. The project is building upon the Locally Marine Managed Areas (LMMA) concept which capitalizes on community-based and co-management practices.

In **Indonesia**, USAID supported the establishment, zoning, and successful implementation of Bunaken National Marine Park in North Sulawesi, and strengthened the management of the Komodo National Park. Effective patrolling mechanisms, with the support of sustainable finance mechanisms, are now in place. USAID is presently supporting large-scale ecoregional management of the Wakatobi National Park and the Raja Ampat area. CRMP Indonesia, funded by USAID/Indonesia, developed several models of ICM at different scales from national policies to local actions. In North Sulawesi province, the project established more than two-dozen small-scale community-based marine reserves in an effort to improve fisheries production among small-scale nearshore fishers. The project also established village-level resource management committees and conducted educational campaigns against the use of destructive fishing practices such as blast and cyanide fishing. The project also assisted the province in developing coastal legislation, which passed into law in 2003, and provided a process for the formal recognition of traditional marine resource use rights.

The USAID-funded *Philippines Coastal Resource Management Project* in the **Philippines** (1996-2004) established ICM in 1/6 of the coastline in that country[3]. This program expanded community-based efforts and fostered a strong commitment by municipal governments to ICM. The CRMP Philippines program established numerous community-based marine protected areas that had significant positive impacts on local fisheries and ecotourism opportunities. This project developed a set of guidebooks for ICM that help field workers in MPA design, tourism planning, evaluation and other related activities.

Another interesting example from the **Philippines** is the *Growth with Equity* (GEM) Program in Mindanao. While not immediately obvious that this program is involved in fisheries management, they have invested significant resources in the fisheries sector and have worked closely with industry associations. They have also assisted with regional and international resource management and trade issues. For instance, the project assisted with the development of a national management plan for the tuna fisheries, provided technical assistance to the Bureau of Fisheries concerning negotiations for the Convention on the Conservation and Management of Highly Migratory Species, with issues arising from the Western and Central Pacific Fisheries Commission, and in trade negotiations concerning exports of canned tuna. Lastly, this program has also played an important role in this post-conflict region and assisted thousands of Moro National Liberation Front ex-combatants resettle into new livelihoods in seaweed farming and finfish culture.

The *Fisheries Improved for Sustainable Harvest* (FISH) project, built on experience from CRMP-**Philippines,** is working in partnership with the Department of Agriculture's Bureau of Fisheries and Aquatic Resources and selected local government units (LGUs) to improve fisheries management and achieve a more sustainable harvest of marine fish stocks in targeted areas. This five year (2003–2008), $8.8 million initiative will support the development and implementation of fisheries management plans, complemented by

[3] www.oneocean.org

policy and public awareness activities, premised on the goal of sustainable use and conservation of natural resources. The expected result is the increase of marine fish stocks by at least 10 percent from established baselines in targeted marine ecosystems within five years, helping to achieve the Mission's strategic objective of protecting productive and life-sustaining natural resources. FISH will emphasize a suite of specific fisheries management activities including:

- implementing marine protected area networks as fishery reserves for "growing" fish populations,
- limiting access to fishery resources through registration of fishers and fishing boats, licensing, zoning, gear restrictions, and other interventions, and
- strengthening fisheries law enforcement and compliance.

In **Tanzania**, USAID/Tanzania is currently supporting small-scale fisheries management through a cooperative agreement with the Coastal Resources Center at the University of Rhode Island. The project focuses on integrated coastal management, but has several elements devoted to fisheries co-management through the development of district-scale management plans including the establishment of several no-take fisheries reserves. The project is also planning to test the use of by-catch reduction devices (BRDs) and turtle excluder devices (TEDs) in the commercial trawl fishery.

There were several regional-scale investments by USAID. The earliest was a regional initiative in the ASEAN region (Association of South East Asian Nations) called the *ASEAN Coastal Resources Management Project* (1988-1991). The ASEAN project launched pilot-scale site-based efforts in **Thailand**, **Philippines**, **Indonesia**, **Singapore** and **Malaysia with a strong cross-country lesson drawing and networking component**.

In the Latin America and Caribbean region, the *Parks in Peril Program* strengthened protected area management through eco-regional and site-based approaches such as the protection of critical spawning aggregation sites, no-take reserves, and promoting co-management and sustainable financing schemes.

In 2004, USAID, the United Nations Foundation, and the International Coral Reef Action Network (ICRAN) began collaborating though a regional project to protect the *Meso-American Coral Reef* off the Caribbean coast of **Mexico, Guatemala**, **Belize** and **Honduras**. The program emphasizes private-sector alliances on sustainable fisheries, sustainable tourism, and watershed management to reduce the threats to coral reefs and coral reef resources, such as fisheries.

At about the same time the ASEAN project was launched, USAID also launched a similar global initiative in ICM (The *Coastal Resources Management Program-CRMP*) with pilot national-scale activities in **Thailand**, **Sri Lanka**, and **Ecuador**. As part of the CRMP (1985-1995), fisheries-related activities in Ecuador included strategies to reduce loss of mangroves due to conversion into shrimp ponds. Activities included improved coordination of enforcement efforts among several agencies. The project also promoted

improved gear design in the post larvae shrimp fishery to reduce by-catch and worked with women's groups in Esmeraldas province to improve management of cockle fisheries. The CRMP was extended (CRMP II) into the new millennium (1995-2003) and included several Mission "buy-ins" in **Kenya**, **Tanzania**, **Indonesia** and **Mexico**, which are described in this report in the section on national level initiatives.

At the global level, the *Sustainable Coastal Communities and Ecosystems* (SUCCESS) Program is a new five-year (October 2004 – September 2009) USAID-funded initiative being implemented by the Coastal Resources Center at the University of Rhode Island in partnership with the University of Hawaii. The SUCCESS Program emphasizes ICM, sustainable mariculture and fisheries. In Nicaragua, Ecuador and Zanzibar, Tanzania the Program is assisting local bivalve harvesters, most of whom are women, to improve management through development of community-based management schemes including the designation of no-take reserves. In Thailand, the Program is working to help rebuild and restart livelihoods in several rural fishing-dominated coastal villages impacted by the December 2004 Indian Ocean Tsunami.

5.2 Major Organizations and Institutions in Fisheries Management: Initiatives, Interests and Implications for USAID

Due to the scale of the fisheries crisis, USAID will need to partner with other institutions and donors to address the complex and growing fisheries management problems. Currently, there are only a few coordinated, large-scale efforts on small-scale marine and freshwater fisheries management. Various donors and institutions have field programs that address fisheries within the context of coastal management and environmental protection, but the investments in the fisheries sector are small in comparison to terrestrial issues and comparable sectors such as forestry. As reflected in the list of persons and institutions interviewed for this assessment (Appendix 2), the main actors in fisheries management are national governments, donor-lead projects, international United Nations-based institutions, and NGOs. This assessment did not review the policy or programs by individual national governments, apart from their involvement in donor-led and NGO projects. Table 7 lists the main international institutions, excepting USAID, that are involved in tropical small-scale fisheries management. (USAID efforts are reviewed in the previous section of this report). Each country has important NGO and government institutions involved in fisheries management that should also be considered.

Two global, fisheries-specific initiatives warrant particular attention: 1) the *Global Program in Fisheries* (PROFISH) and 2) the *Resilient Small-scale Fisheries* initiative. PROFISH, an alliance organized by the World Bank with financing from the Global Environment Facility (GEF), Norway, Iceland and other sources, has funded the following activities and has thus far engaged the IUCN, FAO, and the WorldFish Center:

- Donor alignment for sustainable fisheries, improved governance, and sector reform
- Assessment and creation of an illegal commercial fishing vessel list
- Study on impacts of globalization on fisheries

Table 7. Key International Institutions Involved in Tropical Small-Scale Fisheries Management

Institution	Main Efforts
NGOs	
Conservation International	Marine conservation and applied research, marine protected areas, biodiversity conservation, habitat conservation; global coverage
The Nature Conservancy	Marine conservation and applied research, marine protected areas, biodiversity conservation, habitat conservation, bottom land leasing, fishing license buy-out; global coverage
World Wildlife Fund	Marine conservation and applied research, international and national policy reform, education and outreach to public and private sectors partners, marine protected areas, global coverage
Wildlife Conservation Society	Conservation, applied research, marine protected areas, global coverage
Marine Stewardship Council	Certification of sustainable fisheries, education; mostly developed country contexts
International Union for the Conservation of Nature	Education and policy development, analysis; global coverage
UN/International Organizations	
Food and Agriculture Organization (FAO)	Technical assistance to UN member national governments to encourage sustainable fisheries, applied research, policy development, fisheries statistics; global coverage; fact sheets on gender issues and strategies for the fisheries sector
WorldFish Center	Technical assistance and applied research to reduce poverty and hunger by improving fisheries and aquaculture; tropical global coverage
Donors	
Global Environment Fund (GEF)	Funding for environmental, coastal management, and sustainable fisheries programs; tropical global coverage
World Bank- PROFISH	Funding for development, environmental, coastal management, sustainable fisheries programs; focus on governance, reduction in fishing effort, fishery certification, education; tropical global coverage
Asian Development Bank (ADB)	Funding for development, environmental, coastal management, and sustainable fisheries programs in Asia; gender mainstreaming guidance for the fisheries sector
Inter-American Development Bank (IDB)	Funding for development, environmental, coastal management, and sustainable fisheries programs in the Latin American Caribbean region
International Development Research Centre (IDRC)	Applied research and education, technical assistance; tropical global coverage
NORAD	Sustainable fisheries development; tropical global coverage
MacArthur Foundation	Community-based fisheries management; freshwater and marine conservation, applied research; tropical global coverage
Packard Foundation	Community-based fisheries management and marine conservation, ecosystem-based management; tropical global coverage, past support for gender, population and ICM linkages
Moore Foundation	Marine conservation, ecosystem-based management; no field efforts to date

The following PROFISH initiatives are under development:

- Global assessment of the scale and production from tropical small-scale fisheries
- Toolkits for tropical small-scale fisheries management best practices
- Program to reduce small-scale fishing capacity in Senegal
- Development of certification for tropical large-scale fishery (*Alliance for Responsible Fisheries*/ALLFISH)
- Improved enforcement of fisheries laws and the use of global position system (GPS)-based technology
- Educational materials on FAO Code of Conduct for fisheries

The *Resilient Small-Scale Fisheries* campaign led by the WorldFish Center and FAO has been initiated through a Workshop on Interdisciplinary Approaches to the Assessment of Small-Scale Fisheries, which was held at FAO headquarters in September 2005. WorldFish has developed a draft campaign strategy with the goal to secure and improve food access and income for 20 million poor people dependent on small-scale fisheries by 2015. *Resilient Small-Scale Fisheries* is the first of two WorldFish Center campaigns designed to make a difference to the poor at the global-scale. The WorldFish Center will launch a companion campaign, *Pro-poor Aquaculture*, in 2007. The campaigns are designed to galvanize action, alignment and co-investment around major issues affecting these sectors to help meet the Millennium Development Goals (MDGs). An important objective of both campaigns will be to better position the fisheries and aquaculture sectors to address opportunities and threats from outside traditional sectoral boundaries, including global issues such as trade and environmental change.

5.3 Comparative Advantage of USAID in Fisheries Management

USAID is widely known for its attention to and effectiveness in developing programs that improve environmental management through improved governance and participatory democracy. USAID fisheries and coastal management efforts are respected for their integrated, cross-sectoral approach to problems. Informants outside USAID consistently remark that USAID programs merge technical sophistication with strong educational and grassroots elements. USAID Mission personnel frequently comment about their strong working relations with host country agencies born of longstanding collaborations.

The global network of USAID Missions is also a strength that should be built upon. Understandably, busy Mission personnel cannot always be aware of what is taking place in other Missions. Many express interest in fisheries management and recognize the need for programs, but do not feel they have the technical capacity to launch a program. Some personnel express particular interest in learning from other USAID programs that are more advanced in their fisheries and coastal management efforts.

The long-term commitment of USAID to particular models of resource management, such as integrated coastal management, has resulted in real and sustained progress. New methods for assessment and policy development have been tested in various contexts. Increasingly, outcomes are carefully measured against tangible social and ecological

benchmarks. Print and digital educational materials have widespread impacts within host countries and internationally. Linkages with U.S. academic institutions improve the technical content of programs and provide educational opportunities.

USAID is clearly a global leader in the fields of ICM, biodiversity conservation and environmental management. Since fisheries resources frequently represent the most important coastal resource in many tropical communities, they are frequently emphasized in ICM and biodiversity conservation programs. In addition, fisheries issues are not easily isolated from issues of water and habitat quality, poverty, or gender inequality, thus necessitating an integrated approach.

5.4 Lessons Learned from Past USAID Efforts

It is difficult to generalize across sectors, approaches, and contexts. In fact, the hallmark of effective USAID programs has been their careful attention to site-appropriate planning and implementation. Nonetheless, the following are some key lessons that are carried forward in this report's recommendations for fisheries.

- USAID must work as a partner with government organizations, non-government organizations, scientific organizations, donors, civil society organizations, and other constituencies as appropriate.
- Conservation and livelihoods issues must be tackled in tandem; separate treatment is unlikely to be effective given their intrinsic inter-relatedness.
- Fisheries and land use activities should also be addressed in tandem since men and women in fisher households typically engage in multiple livelihood activities.
- Meaningful involvement of communities and other stakeholders is essential.
- Gender mainstreaming and addressing gender inequality are key elements to the success and sustainability of resource management and governance activities.
- Upper-level legal and policy work should support field implementation.
- Careful attention to context-appropriate formal and informal governance mechanisms fosters commitment, equity, and participation.
- Carefully designed experimentation and adaptation are essential to the development of effective management approaches.
- Program monitoring and evaluation are fundamental to develop responsive programs, an understanding of social and environmental impacts, and the evolution of practice.
- Awareness raising and human capacity development are the basis for long-term commitment and success.
- Financial and technical commitment must be consistent until self-financing mechanisms are developed, if possible.

5.5 Catalytic Role for USAID in Reforming Nearshore Small-Scale Marine and Freshwater Capture Fisheries

This assessment is based on a broad consultation with various institutions involved in sustainable fisheries management, environmental management, and development. Appendix 2 consists of a list of individuals and organizations consulted as part of this

assessment. Informants came from non-governmental organizations, donor organizations, United Nations institutions, research institutions, U.S. government agencies, and USAID Washington and Missions. Interviews revealed an enthusiastic endorsement for a new USAID program to improve the management of freshwater and marine small-scale fisheries. The analysis below presents key findings of what is needed and most feasible based on the authors' experience, published analyses, and interviews.

After decades of effort in fisheries, coastal, and environmental management, USAID is positioned to catalyze efforts that could reform small-scale marine and freshwater capture fisheries governance. New programs should build progressively from current hubs of successful investment. For global impact, USAID will need to partner with other donors and institutions in a complementary manner. As highlighted in the following recommendations section, interviewees suggested that USAID should focus on:

- Educational efforts based on carefully designed assessments that inspire attention to critical issues and best practices in the field
- Expanding field efforts and documenting lessons that can inform and catalyze other efforts through continued work with NGOs and government agencies
- Changing open access capture fisheries regimes to those that results in sustainable levels of fishing effort to maintain food security, robust economies, and ecosystem function through partnerships with the private sector, donors, and policy makers
- Testing innovative methods to improve fisheries management and sustainable livelihoods such as rights-based approaches, addressing gender and other representational and economic inequalities, and promoting the use of GPS and internet technology and market-based solutions such as certification
- Supporting USAID field practitioners through educational and advocacy networks that improve understanding of best practices and broaden support for their activities
- Ensuring complementarities of funding agendas with other donors such as the World Bank, International Development Research Centre, and NORAD, among others

5.6 U.S. Government Framework for Foreign Assistance and Linkages to Fisheries Opportunities

Within the US Foreign Assistance Framework, the overarching goal is "Helping to build and sustain democratic, well-governed states that will respond to the needs of their people and conduct themselves responsibly in the international system." Under this goal are five key objectives to guide the U.S. government and USAID assistance: Peace and Security; Governing Justly and Democratically; Investing in People; Economic Growth; and Humanitarian Assistance. These objectives are the strategic underpinning for understanding how the portfolio of investments of the U.S. government in the development sector has been shaped. USAID is currently supporting levels of activity in fisheries resource management in ways that contribute to many of the objectives identified. In addition, the USG has cataloged countries around the world depending upon where that country is located along a development spectrum. Each country category has development approaches tailored to its unique circumstances. Equally important for this

report, there are clear linkages to the fisheries sector in each category and these provide strong justification for future engagement by USAID in the fisheries sector.

- *Rebuilding Countries*: USAID provides targeted assistance to States in or emerging and rebuilding from internal or external conflict. These countries are often highly dependent upon the natural resource base for livelihood and job creation, which are so vital for stabilizing the country and economy, creating alternative livelihoods for former combatants, and reducing poverty. The end goal of assistance is to create a stable environment for good governance, increased availability of essential social services, and initial progress in establishing policies and institutions.
- *Developing Countrie*s: USAID can assist States with low or lower-middle incomes that are not yet meeting MCC performance criteria. USAID can encourage adoption of conducive economic policies, sustainable fisheries resource use, the strengthening of institutional capabilities in the public and private sectors, helping these nations build the capacity to sustain their own progress. The end goal of assistance is to continue progress in expanding and deepening democracy, social services delivery through public and private organizations, and policies that promote economic growth.
- *Transforming Countrie*s: Assist States with low or lower-middle income that meet MCC performance criteria and the criterion related to political rights. Nurture progress toward partnerships on security and law enforcement, and provide limited resources and technical assistance to reinforce and consolidate good governance.
- *Sustaining Partnership Countrie*s: Provide support to States with upper-middle income or greater to sustain partnerships, progress and peace.
- *Restrictive Countries*: Promote a market-based economy and address humanitarian needs in states of concern, where there are significant governance issues.

All of the US Foreign Assistance Framework Objectives—i.e., Peace and Security, Governing Justly and Democratically, Investing in People, Economic Growth, and Humanitarian Assistance—are linked with how fisheries are managed, and ocean and freshwater systems are governed (or what needs to happen when poorly managed).

- It is increasingly apparent that failed fisheries management will result in poverty and food insecurity.
- Participatory and equitable fisheries management is fundamental to success and sustainable policies.
- Human resources and technical capacity underpin all successful fisheries management efforts and are lacking in many contexts.
- Sustainable fisheries management will result in economic growth that provides jobs, food, and cultural values over the long-term.
- Finally, sustainable fisheries management will reduce humanitarian crises and food insecurity and provide opportunities for nations emerging from conflict and poverty.

An integrated approach linking all of these objectives is fundamental to success. Strategies need to be tailored to each context—including the ecological, socio-economic, institutional, and cultural contexts. A diverse portfolio of programs can build from longstanding efforts in some contexts to spread their experience to new contexts.

6. Recommendations for Secure Fishing Communities and Sustainable Resource Management: A Strategic Opportunity for USAID Investment in Small-Scale Fisheries

6.1 The Opportunity

USAID is strategically positioned to promote more sustainable fisheries management. The Agency can assist in addressing the key issues plaguing small-scale fisheries in developing countries, which are:

- weak governance including a lack of defined and enforced property and use rights,
- excess fishing capacity,
- illegal fishing,
- endemic poverty, and
- impacts of globalization of fisheries trade.

Many of these issues were highlighted in the October 3, 2006 Presidential Memorandum to the Secretaries of State and Commerce (see Appendix 1), which urges them to work with other countries and regional and international organizations to promote sustainable fisheries and end destructive fishing practices.[4]

Failure to address these issues effectively in the past is resulting in significant social and economic consequences for millions of people living in fishing communities. It negatively impacts billions of primarily poor people who rely on their catches as a critical source of high protein food and it severely impacts marine and coastal ecosystem resilience and biodiversity. These problems will only worsen if national governments and international donors continue to give low priority to capture fisheries issues.

As mentioned numerous times in this report, USAID cannot expect to address all of these issues alone. It will require partnering with national governments, NGOs, other donors, the private sector and other U.S. government agencies to address these challenges in a strategic, multifaceted and coordinated manner.

6.2 The Goal

USAID should make an organizational commitment to address several critical issues in fisheries management. ***The goal should be to achieve economically and politically secure fishing communities by strengthening governance for sustainable small-scale fisheries***.

The emphasis should be on the small-scale fisheries, which have often been neglected by fisheries assistance and development programs in the past. USAID should only address the industrial fishing sector in those instances or on those issues where this sector is

[4] http://www.whitehouse.gov/news/releases/2006/10/20061003.html#

negatively impacting small-scale fisheries. With this said, USAID emphasis should be in two primary areas:

- **Strengthening governance capacity for small-scale fisheries, and**
- **Reducing excess fishing capacity**

With respect to strengthening governance, USAID should champion the imperative of placing small-scale fisheries management into the context of integrated approaches, including ecosystem-based management. This needs to be done carefully, however, as in the developing country context it involves increasing complexity of management arrangements in countries where capacity is typically weak and where participatory planning processes are fundamental to encouraging commitment to change. Emerging experience from the Philippines will likely provide insights in adapting this approach in other developing country contexts. Capacity-building of resource managers, users and governance institutions will be important. While intervention needs to be tailored to the local context, co-management approaches and spatial management techniques such as marine reserves and zoning should be emphasized. It should be noted, however, that the problems of small-scale fisheries cannot be solved from a sector-based approach alone. Many of the solutions must also come from outside the fisheries sector. Therefore, an integrated approach must also include addressing political and economic marginalization as well as community and economic development including livelihoods.

With respect to reducing fishing capacity, the strategies being applied to industrial fisheries such as vessel buy-backs and individual transferable quotas (ITQs) are not applicable to small-scale fisheries. A multifaceted approach is required, especially one that integrates resource management with a livelihoods approach. **Resource management should involve strategies that include access control and defined property or user rights, including the adoption of marine tenure regimes and localized territorial use rights**. Basic fisheries management techniques such as gear restrictions and fishing effort reduction should also be implemented. A special emphasis should be on strategies for excluding industrial fishing vessels—especially large trawlers—from inshore grounds, which often are already legally designated as reserved for artisanal fisheries. Lastly, investment in the certification of artisanal fisheries products for exports to the U.S. and elsewhere should be pursued where possible. This requires niche marketing and in some cases combining the products from several locales so as to guarantee adequate supply. This also requires working with the private sector to create the demand for products and the willingness for the private sector to invest in sound management.

6.3 Rationale

As identified in Table 1 of this report, the direct socio-economic and environmental benefits of small-scale vs. industrial-scale fisheries warrant donor attention and investment in small-scale fisheries. For developing countries, small-scale fisheries are critical for employment, income, and food security. Small-scale fisheries produce a greater tonnage of catch compared to industrial fisheries; yet, in the process of landing

this catch, small-scale fisheries consume far less fuel and net far less by-catch. However, the complexities inherent in small-scale fisheries make finding solutions more difficult.

The fishing communities in many developing countries, whether in marine or freshwater environments, generally can be described as poor. Although this is not to say that all areas and all people are poor. These communities generally have a higher percentage of people living below the poverty line than the national average. The high dependence on natural resources makes these communities particularly vulnerable to changes in resource conditions. In turn, their reliance on these natural resources places greater stress on biodiversity and the environment.

These fishing communities can be generally described as facing a growing degree of insecurity as a result of many converging factors. These include overfishing, destructive and illegal fishing practices, excess capacity of capital and labor, weak governance, degraded ecosystems and habitats, high population growth, poverty, limited alternative livelihoods, limited access to land, economic and political marginalization, limited market access, conflict over resources, and food security. Few communities can see a way out of the growing insecurity caused by these multiple and complex factors.

A complex, negative feedback cycle is created in this situation, whereby rapid population growth paralleled by fewer economic opportunities and limited access to productive land increases both the number of people dependent on fishery resources and thus the number of fishers. Increased fishing pressure results in fish population declines and stock collapses, degraded biodiversity, and increased resource competition, both between fishers and scales of fishing operation (e.g., small versus commercial). The result is reduced income and food security, increased poverty, and a lower overall standard of living and national welfare. This, in turn, drives users to employ more destructive and over-efficient fishing technologies in the ‘rush’ to catch what remains, thereby further depleting fishery populations. These factors lead to further-increased user competition, and thus higher rates and probabilities of human conflict, over the remaining stocks. This destructive cycle leads to a pattern of self-reinforcing conflicts with deteriorating social and environmental consequences. Such conflicts are not always passive in nature and armed conflict and violence is increasingly being reported as a common issue. Decreasing fish stocks combined with increasing conflict are driving some people out of the fishery. This is leading to increasing unemployment in many rural areas. In many coastal communities, this added level of instability is thought to fuel social unrest and increasing levels of insecurity.

A variety of responses, including social and economic development, regulations, and resource development and management, have been applied to the problems faced in fishing communities in developing countries. The results have been highly variable. Implementing even simple recommendations has been difficult due to institutional weakness, poor understanding, and the lack of political will. Experience shows repeatedly that the best results are obtained by a diversified program that addresses several root problems simultaneously. These can be characterized as a set of good practices.

- Achieving sustained progress requires engaging the men and women of fishing communities in a dialogue about the future they envision, the steps needed to get there, and the lessons that are learned along the way. It requires engaging a much broader array of actors across government, civil society, and the private sector to build understanding of the reforms needed and the commitment to undertake them.
- Policies and actions must address the root causes of vulnerability, insecurity and instability. This requires understanding the means by which households adapt to reduce their risks, the incentives that drive the decisions of resource users, and the sources of their vulnerability to stresses and shocks.
- Community institutions must be strengthened and approaches must be cross-cutting and integrative.
- A multi-sectoral approach is required—one that links social development, economic development, empowerment and co-management.

The strategy proposed above and the following recommendations are well suited to the overall goal of the U.S. Framework for Foreign Assistance: ***"Helping to build and sustain democratic, well-governed states that respond to the needs of their people and conduct themselves responsibly in the international system."*** Each of the five core objectives of the framework respond to specific issues and threats facing small-scale fisheries:

- *Governing Justly and Democratically*: weak governance, lack of participation, illegal fishing
- *Economic Growth*: poverty, globalization of trade and market access, technological advances
- *Peace and Security*: poor enforcement, maritime security, securing "leaky borders", linkages to piracy and drug trafficking and "fish wars"
- *Investing in People*: food insecurity, poor nutrition, vulnerability to HIV/AIDS, population growth, political and economic marginalization, gender inequality and inequity
- *Humanitarian Assistanc*e: addressing the vulnerability of fishing communities to tsunamis and hurricanes, impacts of conflict-driven migration on biodiversity

6.4 Specific Recommendations for Secure Fishing Communities at the Global, Regional and National Level

If managed more effectively, capture fisheries can provide an economic development dividend to numerous countries around the world. Better management can also avoid the continuing collapse of aquatic and marine ecosystems and associated biodiversity occurring throughout the world's oceans and aquatic environments. Specific recommendations are provided below that address key issues and threats previously described. They demonstrate how USAID can capitalize on its comparative advantage and seize general opportunities described previously at the national, regional and global-scales. The outcomes will contribute significantly to the goals of the U.S. foreign assistance framework. Several of the recommendations, particularly at the regional and international level may not involve the small-scale sector exclusively and may include

management of large-scale fisheries as well. In some instances, this may provide opportunities for more linkages between USAID and the National Oceanic and Atmospheric Administration (NOAA) and the Department of State (DOS), which are also well equipped to provide international assistance on fisheries management issues at all scales.

6.4.1 Global Opportunities

Global level opportunities are appropriate to the centrally based units within USAID. These emphasize services to USAID Missions and Regional Bureaus, or a catalytic and coordinating role with international organizations with capture fisheries interests. While USAID plays an important role in the latter, clearly there are opportunities and roles for other U.S. Government agencies including the Department of State and the Department of Commerce (NOAA in particular) and Department of the Interior (e.g. Fish and Wildlife Service). At the global level, USAID should play an important advocacy role. Very few people appreciate the enormous impacts of artisanal fisheries and how well they compare to industrial fisheries in terms of catches, jobs, or impacts (see Table 1). Improved management of small-scale fisheries is a significant issue that offers major opportunities to increase security for billions of people including many of the poorest and most unstable. The specter of the "no action" or "business as usual" option leads us only to the continuing collapse of fisheries at a global-scale and very likely associated losses of aquatic and marine biodiversity (see Worm et al. 2006).

1. *Build the capacity of USAID Mission staff and Regional Bureaus in sustainable capture fisheries through USAID/EGAT-led workshops that support priority setting and strategic planning by USAID Missions and Bureaus*

Goal: Strengthen the ability of USAID Missions to promote improved economic development through opportunities in sustainable fisheries management.

Rationale: USAID personnel and national economic planners are often unaware of the lost economic opportunities from poor fisheries sector governance and overinvestment in capture fisheries harvest capacity. Significant opportunities are often missed. Personnel require a foundation of knowledge and understanding of the key issues if they are to develop strategies likely to generate positive results. USAID/EGAT can provide Mission staff and national leaders with this information as well as technical assistance in project designs, implementation and evaluation.

Strategy: USAID/EGAT should develop a programming guide for the capture fisheries management modeled after the Biodiversity Guide[5] that USAID previously developed. The goal of this Guide should be to provide USAID staff and partners with basic information about designing, managing, and implementing sustainable fisheries programs or activities. The contents of this guide should include what a USAID manager needs to know in order to design, implement, manage, and evaluate a capture fisheries program or activity. What are the critical elements of success for capture fisheries programs? How

[5] http://www.rmportal.net/tools/biodiversity-conservation-tools/biod-guide-2005/

can activities be designed that will simultaneously meet USAID administrative and legal requirements while ensuring development goals are addressed using best practices and approaches? USAID regional offices should then host a series of workshops for USAID and selected national government personnel that raise awareness on fisheries issues, coastal ecosystem governance, policy reform, and options for effective fisheries management strategies. Gender mainstreaming strategies should also be discussed as this is a weakness of many fisheries initiatives. As a complement to the programming guide, there should be teaching case studies that address the reasons and consequences of both management failures and, more importantly, the few and precious successes. A special emphasis should be on dissemination of successes and good practices as these apply to co-management and the roles of MPAs.

2. ***Promote public-private sector alliances***

Goal: Expand the USAID Global Development Alliance (GDA) portfolio to include fisheries sector opportunities with a focus on fair trade and sustainable trade in seafood.

Rationale: USAID has demonstrated the ability to catalyze public-private sector partnerships that can earn economic dividends and promote environmentally sustainable international trade and development. The GDA has an excellent track record including programs focused on natural resources, such as the Sustainable Forest Products Global Alliance. An explicit move into the fisheries sector would seem a natural diversification of the GDA portfolio. As a result of the rapidly expanding global trade in fisheries and aquatic resource products, a majority of imports to the U.S. will come primarily from developing countries. Not all of this trade is from small-scale fisheries and a good deal is from large-scale fisheries operations. Certification schemes for large-scale fisheries have raised consumer and producer awareness and encouraged sustainable harvest practices. There have been few such efforts directed at tropical small-scale fisheries and educational efforts are needed for both the restaurant industry and consumers. There are major seafood buyers in the U.S., e.g. Wal-Mart, which have committed to purchasing all their seafood products from sustainable sources. Hence, it would seem that there are a number of potential and ready partners for such initiatives on the U.S. demand side of the supply chain. Certification should, however, move to include fair trade and ensure that the trade is sustainable.

Strategy: USAID/EGAT should develop initiatives in public-private alliances that ensure sustainable global trade and fair trade of fishery products. While this report has focused primarily on small-scale capture fisheries, this is one area where USAID also needs to give more attention to promoting a sustainable large-scale fisheries sector. Since large-scale fisheries often impact negatively on small-scale fisheries, sustainability should include consideration of environmental factors as well as social equity. While the assessment team did not include discussions with major private sector U.S. seafood buyers, this is a logical next step for USAID. USAID/EGAT should convene a workshop on private-public sector partnerships with attention to examining lessons from existing partnerships, which can be applied specifically to capture fisheries and international seafood trade.

3. *Disseminate lessons learned and establish regional learning networks*

Goal: Strengthen the commitment to sustainable fisheries management within national governments. Create learning networks that support champions for fisheries management and ensure that new champions are capacitated and encouraged.

Rationale: Fisheries government officials engaged in and advocating for sustainable fisheries management can oftentimes feel isolated. These champions require professional support to flourish. Lessons derived in one context are oftentimes valuable and adaptable to other contexts. For instance, USAID/Philippines has invested heavily in integrated coastal management and sustainable fisheries initiatives that provide a wealth of experience and lessons that could be shared with other nations within the region.

Strategy: USAID regional offices should host a series of workshops for USAID and government personnel that review strategic fisheries management issues and plans at the regional and national levels. These workshops should also serve as educational events whereby fisheries experts could raise awareness about issues related to fisheries, ocean governance, and policy reform options drawing on both region-specific and international experience. Each series of workshops should result in specific actions to engage USAID Missions, other donors, academic and research institutions, government and NGO entities in improved management. USAID/EGAT could assist in the design and implementation of these workshops.

4. *Provide leadership and advocacy*

Goal: Advocate for more resources and attention by donors and national governments to sustainable fisheries management as an economic development opportunity as well as a biodiversity conservation strategy.

Rationale: USAID has demonstrated leadership capability in the past with respect to integrated coastal management efforts that have now mushroomed around the world—in good part due to USAID global, regional and country investments and outreach. USAID can do the same with respect to sustainable capture fisheries management, which could help earn substantial economic dividends and prevent widespread collapse of this sector.

Strategy: USAID should communicate the growing awareness of the impacts of unsustainable fisheries on biodiversity, livelihoods, and food security as well as its link to economic losses. USAID should also disseminate important lessons learned from sustainable fisheries management efforts within and outside the USAID project portfolio. USAID should catalyze a commitment to global fisheries reform by engaging with other U.S. government agencies, donors, NGOs, and technical bodies. In particular USAID/EGAT should encourage other USAID and U.S. government programs, as well as the larger development community, to consider the importance of sustainable fisheries management, fisheries livelihoods, and ocean governance. As a first step, host a high-level and widely publicized speaker series in Washington D.C. on sustainable fisheries.

5. *Coordinate with key donors and international institutions*

Goal: Raise donor awareness of the importance of making immediate investments in reforming small-scale fisheries management.

Rationale: Donors may often be slow to respond to crises that are "slow-growing" and which do not lend themselves to a "quick-fix" approach, but rather require a longer-term commitment of time and money and require a fundamental change in thinking and strategy to problems that have a long history and which span the environmental, social, and economic spheres. Without such investment by not one, but a consortia of partners and donors, the challenges facing the small-scale fisheries sector may not be overcome.

Strategy: USAID should collaborate with other donors and global technical institutions focused on small-scale fisheries management. In particular, USAID should carefully consider participation with the PROFISH initiative, which is led by the World Bank with financial support of Iceland, Norway, GEF and other donors and implemented with FAO, the WorldFish Center, and the World Conservation Union (IUCN). Participation will support donor coordination and help USAID leverage its financial support against large investments. USAID can provide important technical guidance to PROFISH, especially with regards to integrated approaches toward coastal and fisheries management. Collaboration with PROFISH will provide opportunities to collaborate in programs to address illegal, unregulated, unreported (IUU) fishing, excess fishing capacity, and governance reform.

USAID should also consider supporting the *Resilient Small-Scale Fisheries Campaign* led by the WorldFish Center in partnership with FAO, IUCN, WWF and the Marine Stewardship Council. The goal of this campaign is to provide by the year 2015 secure and improved food access and income for 20 million poor people dependent on small-scale fisheries.

6. *Consider a Presidential Initiative for sustainable fisheries*

Goal: Raise the level of importance of sustainable fisheries management through an initiative supported by the highest levels of U.S. government—an initiative that makes a strong statement of undeniable U.S. commitment to the effort.

Rationale: Many of the aforementioned recommendations can build on or be incorporated into a comprehensive Presidential Initiative for Sustainable Fisheries. In addition to USAID, a Presidential Initiative can draw from the considerable technical capacity available within various U.S. government institutions to provide assistance and guidance for fisheries reform. Other key U.S. government partners should include the departments of State, Commerce and Interior. Such an initiative would be a timely response to the October 3, 2006 Presidential Memorandum for the Secretary of State and the Secretary of Commerce to work with other countries as well as regional and international organizations to promote sustainable fisheries and end destructive fishing

practices.[6] The memorandum directs these agencies to work with other countries and international organizations to eliminate fishing practices that jeopardize fish stocks and associated habitats, or that provide an unfair commercial advantage. This includes fisheries under national jurisdiction as well as fisheries on the high seas. It also directs the U.S. agencies to work with other countries to enhance monitoring and surveillance systems to combat illegal, unregulated, and unreported fishing (see Appendix 1 for full text of the memorandum). A Presidential Initiative would also support several recommendations made by the U.S. Commission on Ocean Policy and the Pew Oceans Commission.

Strategy: A Presidential Initiative should be multifaceted and support more secure lives and incomes for the men, women and children who live in fishing communities, promote peace and security, increase food security, and biodiversity conservation. It should consider both small and large-scale fisheries management in an integrated manner where appropriate. This initiative would economically benefit developing countries, help ensure sustained trade in fisheries products for the U.S. market, and work towards improved conservation goals. USAID leadership should open discussion with other key U.S. government agencies on how such an initiative can be launched and made operational. The Presidential Initiative should provide global-level support to improved governance and fishing capacity reduction programs as described above. This initiative should be attentive to context and historic efforts. While enforcement and security are important facets of fisheries management, the Initiative should go beyond those strategies to improve human capacity and integrated approaches for fisheries management at various levels.

7. *Additional recommendations*

- Within the *Food for Peace Program* and the Chronic Food Insecurity Countries, include wild fisheries management under sustainable agricultural approaches, similar to the successful *Management of Aquatic Ecosystems through Community Husbandry*/MACH program in Bangladesh.
- Ensure that capture fisheries management and responsible use of generated revenues from seafood are included under the Extractive Industries Initiative.
- Address labor and environmental compliance issues associated with capture fisheries under future and present Free Trade Agreements, such as the Dominican Republic and Central American Free Trade Agreement (DR-CAFTA).
- Build trade capacity in developing countries for negotiating equitable and appropriate access agreements.
- Expand integrated population-environment programs with a focus on fishing communities, such as the *successful Integrated Population and Coastal Resources Management* (IPOPCORM) program.
- Capitalize on the expertise and capacity-building experience within the U.S. university community on wild fisheries management: provide core funding through

[6] http://www.whitehouse.gov/news/releases/2006/10/20061003.html#

the Collaborative Research and Support Program for capture fisheries, and establish training opportunities for fisheries managers in developing countries.

6.4.2 Regional Opportunities

Regional efforts by USAID should focus on supporting sustainable fisheries management through strategic planning, capacity development, networking, and by strengthening transnational governance arrangements. Specific activities should take place in all regions considered in this report. However, with respect to Asia, sustainable fisheries and environmental management in the Mekong River area, while important, is now supported by various other donors. While it is a high priority aquatic biodiversity area, USAID should not consider any strategic interventions at this time.

8. *Africa-wide: Tackle HIV/AIDS in the fisheries sector in Africa and food insecurity for fishing communities*

Goals: Reduce the incidence and impacts of HIV/AIDS in the fisheries sector in Africa through education, knowledge exchanges, and aquaculture options for households affected by HIV/AIDS and malnutrition. In addition, build capture fisheries and aquaculture activities into the *Initiative to End Hunger in Africa* (IEHA).

Rationale: The development community has been slow to recognize that fishing communities in low and middle-income countries worldwide—particularly in Africa—constitute one of the highest risk groups for HIV/AIDS. As a consequence, few HIV/AIDS programs have specifically targeted fishing communities; much needed research on the topic is still at an early stage; and understanding of susceptibility and resilience within the sector is still very limited. While there are now some good examples of work that has improved the information base on HIV/AIDS in fishing communities and there is growing experience in tackling HIV/AIDS, these efforts overall are patchy and insufficient. There is a need for a much larger and coordinated effort by a wide range of organizations and groups to develop and implement policies to reduce and counter the effects of HIV and AIDS in fishing communities. In the absence of such effort, those countries with important fisheries will be hard-hit by HIV/AIDS and lose the much-needed opportunity for rural economic growth and poverty reduction.

Fisheries can contribute significantly to addressing the problem of food security , especially for those households affected by HIV/AIDS and other vulnerable groups (e.g., refugees).

Strategy: USAID should support an Africa regional initiative on HIV/AIDS in fishing communities that would seek to:

1) improve the understanding of HIV/AIDS dynamics and risk factors in small-scale fisheries, and develop response strategies;
2) strengthen the contribution of fish to food and nutritional security and child health among the poor;

3) develop aquaculture options for households affected by HIV/AIDS and malnutrition; and
4) enhance knowledge exchange and application through a regional Research and Development Network on Fisheries and HIV/AIDS.

The WorldFish Center has identified organizations and individuals with relevant experience and expertise in this field in Africa (WorldFish Center, 2006). WorldFish is currently working with FAO and the United Kingdom's Department for International Development (DFID), through their *Sustainable Fisheries Livelihood Program*, to tackle these issues in selected countries in West and Southern Africa. USAID could complement this initiative with support to activities in other countries.

9. *African Rift Lakes: Promote transboundary integrated lake fishery management in the*

Goal: Establish an integrated ecosystem-based approach to fisheries management.

Rationale: Africa's Rift Valley stretches from the Red Sea in the north to Mozambique in the south (see Appendix 3 for details). With a great variety of lakes, rivers and wetlands, this bioregion supports unique flora and fauna. Fifteen percent of freshwater fish species globally are present in the Rift Valley lakes and rivers. Levels of endemism are high. Surrounding these lakes, millions of people depend on the lakes to farm, fish, or practice a combination of both, and are dependent on the ecosystem and its services whether for fishing or for irrigation. Near shore and offshore fisheries are resulting in overexploitation and excessive by-catch in many areas. Exotic species, especially in Lake Victoria, are altering the flora and fauna, and affecting fisheries activities (both negatively and positively). The countries surrounding these lakes are among the poorest in the world and population growth rates are high. Concerted efforts are being made to address the problem but mechanisms for the management of these lakes are not yet well advanced, particularly where several countries are involved.

Strategy: There is need for an ecosystem-wide transboundary approach to lake fisheries management. USAID should support the development of capacity among planners and managers at sub-regional and national levels to integrate fisheries priorities into integrated water resource planning and management. Tertiary education and research institutes in Africa should be assisted to provide science and training services required for better water resource planning and management. Efforts could include an expansion of women's participation in fisheries and water management studies at this level. USAID should support regional and basin-wide fisheries bodies to manage shared resources and the participation of both women professionals and organizations that represent women's interests. USAID should invest in fisheries management programs that address the issues of governance at multiple scales, including water management at the watershed scale, and co-management of individual fisheries at the local scale. Effective marketing should be supported with investments (public and private) in post-harvest (processing and trading) infrastructure, including the development of technologies for improved processing in specific fisheries and development of capacity through public private partnerships to

disseminate and use these technologies. Training for men and women in enterprise management and marketing strategies along the marketing chain should be a priority. Lake Malawi should be prioritized given past USAID program support and strong government interest.

10. *Congo Basin: Promote fisheries management in support of sustainable livelihoods*

Goal: Develop sustainable fisheries initiatives that are integrated with democracy and governance programs as well as conservation initiatives that emphasize improved livelihoods and participatory governance.

Rationale: The Congo River Basin is a very important river system in terms of livelihoods and freshwater biodiversity, while also being critical to the health of Africa's largest area of rainforest. Freshwater fish play an important role in contributing to the diets of people in the Congo Basin. Meanwhile, the population in the Basin countries will double between 2005 and 2020—placing additional strain on this productive but fragile system. USAID has significant experience in using a sustainable livelihoods approach to the artisanal fisheries of the Congo, Kasai and Ubangi Rivers and lakes in the region. This includes two already-implemented freshwater fisheries projects: the *Congo River Environment and Development Project* (CREDP), which focused exclusively on fisheries, and the *Congo Livelihood and Food Security Project* (CLIFFS) project, one element of which focused on artisanal fisheries. Efforts towards establishing the enabling conditions for community-based fisheries management were also started. Rapid assessments have been made of the fisheries and approximately 200 fisher groups organized into associations that can implement management strategies. Issues and needs for moving towards improved fisheries management have been identified including economic impacts of corruption.

Strategy: USAID should build fisheries governance into national or regional programs addressing democracy, governance and corruption in the Congo Basin. There is a good degree of readiness for further initiatives that build on the past USAID freshwater fisheries experience. The issue of corruption with respect to fisheries trade on the river systems needs to be addressed as part of economic development initiatives. Strengthened local-level governance can be achieved through the existing fisher associations as well as by building the national level institutional and legal enabling conditions for community-based management. Community-based initiatives should revisit and integrate traditional fisheries management practices into new systems of governance where appropriate.

The other opportunity for a regional freshwater fisheries initiative is the *Central Africa Regional Program for the Environment* (CARPE), a three-phase, 15-year program focused ultimately on the conservation of Africa's largest area of rainforest in the Congo River Basin. In particular, conservation and livelihoods issues must be tackled in tandem. Fisheries activities should be developed with active participation of women, including those from the Baka and Bantu ethnic groups. Support could include technologies for increasing fish value and sanitation, a subsector heavily dominated by women workers

who could directly benefit. Participation of men and women in community planning is essential to success of this program, which would benefit from USAID experience elsewhere. Building from CARPE and based on a consideration of important fisheries, the following areas should be prioritized:

- Salonga-Lukenie-Sankaru (in the Democratic Republic of the Congo)
- Lakes Tele and Tumba (lakes in the Democratic Republic of the Congo, but sub-basin also includes parts of the Republic of Congo)
- Maringa–Wopori–Wamba (the Democratic Republic of the Congo)
- Virungas (i.e., including the Rift Valley lakes located in the eastern region of the Democratic Republic of the Congo and neighboring countries)

11. *Amazon Basin: Improve freshwater fisheries management through the establishment of protected area networks*

Goal: Establish a system of viable freshwater protected areas to improve fish yields.

Rationale: The Amazon Basin has high levels of biodiversity and is an area of important fisheries. There are important USAID investments in terrestrial protected areas in the Amazon that could be expanded to aquatic areas in order to improve fisheries management. As with marine contexts, protected areas nested within other sustainable fisheries management techniques can sustain fish yields, protect critical habitats and provide important reference sites.

S**trategy:** Work with local and international environmental groups, male and female community representatives, and the Amazon Basin governments to establish a network of freshwater protected areas. Current USAID-supported efforts should be expanded to include fisheries and aquatic protected areas. The ecological and social impacts on men and women and indigenous groups from protected area establishment should be carefully monitored to inform management. In particular, impacts on fish stocks and fish yields should be monitored and used to improve protected area design. The regional office should consider support for any multinational efforts.

12. *Association of South East Asian Nations (ASEAN) Region: Strengthen transboundary fisheries management*

Goal: Reduce regional overfishing, illegal fishing and illegal fish trading in the region.

Rationale: Many fisheries issues in the Association of South East Asian Nations (ASEAN) region are transboundary in nature due to fish stock distributions, habitat linkages, and global trade. Both illegal fishing and live fish trading activities also commonly cross national borders. Trade in live fish caught illegally with cyanide remains a stubborn problem—difficult to address only at the national level. Live fish consumer countries in the region, such as China, Hong Kong, and Taiwan, need to be brought into discussions for both cyanide-caught fish and the trade in live groupers and other tropical species, which face severe overfishing and extirpation in some localities.

Regional effort reduction strategies are necessary given that many of the national fishing fleets in ASEAN and adjacent Asian countries stray into neighboring countries' exclusive economic zones (EEZs) to find fish—as their own waters are already overfished—creating maritime enforcement problems throughout the region. This has created additional regional issues exacerbating many of the existing tensions between nations due to numerous unresolved maritime boundary disputes such as in the Spratly Islands.

Strategy: USAID/RDM/A should consider expanding its current initiatives with the ASEAN Wildlife Enforcement Network in reducing illegal wildlife trade to include reducing trade in cyanide-caught fisheries and other threatened marine species. While regional illegal fish trade is one issue, assistance in formulating and negotiating region-wide effort-reduction strategies would also be useful. One potential opportunity for private–public sector alliances and linked to overfishing and overcapacity issues would be to explore sustainable fisheries certification by working with the Asia Pacific Fisheries Commission, and the ASEAN Fisheries Federation and Marine Stewardship Council. Particular attention on the freshwater side should be placed on improved transboundary management of the endangered giant Mekong catfish. RDM/A can also play a role in promoting regional dialogues on fisheries management and improved governance. It can also provide technical support to regional alliances and networks in the areas of policy and regulation development and capacity building.

6.4.3 National-level Opportunities

National-level recommendations are grounded in the consideration of social and environmental conditions described in sections 2 and 3 of this report. USAID actions at the national scale should demonstrate how priorities for strengthening governance and for reducing excess capacity can be achieved while integrating other key objectives on biodiversity conservation, food security, and livelihood development. In terms of social inclusion and equity, such national initiatives should be designed so as to include and benefit women and men, as well as other groups marginalized due to ethnicity, age or other factors. These recommendations are brief. Ideally, a national level assessment of the capture fisheries sector should be a first step in any subsequent program design.

13. *Conduct national level assessments*

Goal: Improve the data on (and data access to) small-scale fisheries as a basis for more effectively understanding and analyzing the workings of the sector, its linkages with and relationships to other sectors, and its impacts on the ecosystem and the economy.

Rationale: As mentioned throughout this report, reliable data on small-scale fisheries is more often than not non-existent, inaccurate, unknown, or unwilling to be released. As long as this situation remains, it is impossible to create a true profile of the sector—its challenges, its current contributions to local, national, and world economies, its potential opportunities, and the costs of the world taking no action (or action too late) to address the current situation of increasing demand, decreasing supply, and fishing overcapacity.

USAID and others can change this with development and training in a more systematic approach to data collection and synthesis appropriate for small-scale tropical fisheries. Examples from **Namibia** of freshwater fisheries assessments could potentially serve as models for other Missions.

Strategy: USAID should support assessments of small-scale fisheries at the national level that are aggregated to the regional and global levels. USAID/EGAT could assist with designing such assessments. Good policy and projects are based on reliable information. While the issues facing small-scale fisheries are known, current understanding of basic statistics—such as the number of fishers, catch and economic contributions of small-scale fisheries at global, regional and national level—is notoriously poor. PROFISH and other institutions are launching such assessments.

Latin America and Caribbean

Fisheries management efforts in the LAC region are diverse—considering the differences of South American and Caribbean Basin fisheries. Country-specific recommendations provided below should be viewed as starting points for further discussions and possible design of specific Mission-funded projects.

14. ***Brazil: Improve information for decision-making for the marine extractive reserve movement for controlling access and strengthening user rights***

Goal: Support the growing network of recently established marine extractive reserves (MERs) with skills training in sustainable small-scale fisheries management, sustainable aquaculture, and integrated coastal management.

Rationale: More than two million male and female small-scale Brazilian fishers depend on the resource for income and food. Yet, most if not all of Brazil's nearshore fisheries are in a state of decline due to overexploitation and habitat degradation. This is exacerbated by the rapid growth of shrimp farming (growing in value tenfold from 1999 to 2003), which is having a strong negative impact on small-scale fisheries. In the midst of this distressing situation, Brazil has established a new Special Secretariat for Fisheries and Aquaculture (SEAP)—an encouraging development that warrants support.

Strategy: USAID should provide technical assistance to the newly formed SEAP in the areas of reserve network design, establishment of co-management planning processes, ecological and socio-economic monitoring, and extension service delivery for both fishing and post-harvest activities for men and women. In particular, assistance should be provided to support the recently declared system of 28 marine extractive reserves in nine coastal states covering 735,000 hectares of ocean space. These MERs provide guaranteed access by artisanal fishers to fisheries resources and close what were open access regimes. USAID should also support institutional cooperation between the Brazilian Institute for The Environment (IBAMA) and SEAP. An assessment of the impacts of coastal land transformation should be conducted.

15. *Haiti: Improved fisheries governance and food security through an integrated livelihoods approach*

Goal: Improve the food security of Haitians through an integrated livelihoods approach to sustainable fisheries management, thereby reducing their currently heavy reliance on fisheries and fisheries-related livelihoods as their primary source of income.

Rationale: Haitian fisheries provide important livelihood opportunities (employing approximately 55,000 people according the FAO) and significant protein for the Haitian diet in a context where food security is eroding. Without action leading to more sustainable management of the small-scale fishery, this sector may experience a complete collapse, needlessly impacting poor fishing communities inland and along the coast and resulting not only in food insecurity, but in other negative economic, social and health issues at the individual, community, and even national level.

Strategy: As a country in transition toward democracy, USAID should support Haiti in effective governance of marine resources. To address food security and development needs, fisheries should be considered in USAID livelihood development and food security programs. Although men dominate boat fishing activities, it is Haitian women who buy, clean, salt, treat, transform and transport the fish and other seafood. Economic growth activities related to fisheries value chains have the potential to increase women's (and household) income. Due to the lack of information on Haitian fisheries and needs, a detailed country assessment is the logical first step.

16. *Honduras and Nicaragua: Promote fair and sustainable international trade of lobster and conch fishery resources through private-public sector alliances*

Goal: Achieve sustainable harvests of valuable and overexploited marine species of spiny lobster and conch in Honduras and Nicaragua through fishery certification.

Rationale: This is a high-value, small-scale fishery with, in the case of the lobster, almost all the production targeted for the U.S. market. The fishery has relatively clear lines of trade (unlike most small-scale, multi-species fisheries) primarily to U.S. markets.

Strategy: Develop a sustainable harvest certification program for Caribbean spiny lobster (*Panulirus argus*) and queen conch (*Strombus gigas*). This requires creating review and certification protocols for the various steps in the international trade chain. Certification will require the involvement of law enforcement agencies, especially to address cross-border poaching and harvesting of juveniles. Potential partners include the USAID Global Development Alliance, the USAID regional office in Central America, USAID Missions in Nicaragua and Honduras, the Marine Stewardship Council, U.S. State Department, Millennium Challenge Corporation, Global Environment Fund, World Bank, NGOs and appropriate private sector partners that dominate the market chain. Lessons can be drawn from the MSC Certification of the Baja California spiny lobster (*Panulirus interruptus*). This program should be linked to ongoing efforts to protect the Meso-American Barrier Reef and past efforts to support the Miskito Keys protected area in

Nicaragua by USAID and other donors. Lessons should also be drawn from prior work funded by USAID on market chain analysis for the Caribbean spiny lobster by the Programa Ambiental Regional para Centroamérica (PROARCA).

Efforts to improve economic development and sustainable harvesting of these organisms should be linked to the Dominican Republic-Central American Free Trade Agreement (DR-CAFTA), which is important to USAID Missions in the region. For example, improved phyto-sanitation methods should be applied to lobster. Attention to diver safety and alternative or supplemental livelihood training is an important aspect of this fishery's reform. Since little of the money earned by young male lobster divers returns to their homes and communities, there are an increasing number of destitute female-headed households. Hence, assistance should include alternative livelihood development for these women and funding and training for such activities as marketing and processing of agroforestry products, bark cloth design and marketing, cooked food sales, tailoring, fishing, etc.

17. *Jamaica: Improve fisheries governance through co-management, effort reduction, and increased use of fisheries reserves*

Goal: Improve ocean health and reduce overfishing of coral reef ecosystems through improved governance and policy-making.

Rationale: Jamaica's reefs are biodiverse and heavily overexploited. There have been major ecological shifts in Jamaica's coral reef ecosystem, with large areas now overgrown with algae (due to grazer overfishing, water quality declines, and bleaching). These reefs historically supported important inshore fisheries and are one cornerstone of coastal tourism in this nation.

Strategy: Past efforts supported by USAID and other donors to improve watershed management should be extended to coastal and ocean areas to improve fisheries management. Closure of the open access fishing regime through fishing effort regulation and rights-based management should be the priority. Activities in this area should include the large number of Jamaican professional women already working on environmental issues, as well as balanced representation of community men and women in institutions that coordinate policy reforms. Efforts should be coordinated with the *White Water to Blue Water* program and other USAID-supported protected area management programs. In particular, USAID should consider supporting efforts to protect the reefs and sustainably manage the coral reef fisheries on the Pedro Banks.

18. *Mexico: Strengthen governance through ecosystem-based management of the Sea of Cortez fisheries*

Goal: Improve sustainable fisheries and reduce conflicts between the large-scale and small-scale fishing sectors.

Rationale: The rapid growth of fisheries in the Sea of Cortez has eroded the ecological function of this biodiverse area ranked as one of the world's priority conservation hotspots. There are numerous conflicts between small-scale and commercial fishers. Both the small-scale and large-scale fisheries are overcapitalized. Vessel buy-back programs are underway for the industrial fishery, but subsidies to both sectors are still abundant and confound efforts at capacity reduction. The small-scale fishery is also a leading cause of mortality of the endangered porpoise, the *vacuita*. In addition, the Gulf of California now has one of the first developing country small-scale certified fisheries for lobster and there are opportunities to do the same with other fisheries in the region. There are existing local and international coalitions of concerned groups that are highly motivated and working on these problems at present.

Strategy: USAID should support local organizations working on fisheries management issues in this area. USAID should encourage the establishment of ecosystem-based fisheries management through the establishment of rights-based management, community-based marine protected areas, the mitigation and regulation of fisheries focused on forage fish, effective enforcement and compliance mechanisms, and the development of effective co-management in a context of decentralization to regional levels.

While attention is already being given to the issue of overcapacity in the industrial fisheries sector, similar attention needs to be given to solving the overcapacity problem in the small-scale sector. In addition, conflict resolution strategies are needed between the small-scale and industrial fishing sectors, most likely focused on area restrictions and separation for each of these fleets. Lastly, ways to reduce by-catch of the endangered species *vacuita* through gear exchanges/replacements or modifications should be investigated and then implemented.

All of these initiatives will require high levels of stakeholder engagement and final management strategies embodied in co-management plans and management arrangements. A push for expanding certification to other fisheries in both the small-scale and industrial sectors should be considered—building on the lessons and initial successes of the lobster fishery. These efforts should be coordinated with the David and Lucile Packard Foundation, COBI (*Comunidad y Biodiversidad*, a local NGO), WWF, Conservation International (CI), The Nature Conservancy (TNC) and other institutions engaged in the creation of an alliance for the Sea of Cortez.

Africa

Food security and sustainable economic development should be the focus of site-specific efforts in Africa. Where appropriate, programs should benefit women, youth and other marginalized people. Building more secure and democratic fisheries and community institutions is necessary if food security and economic development goals are to be maintained in the long-term.

19. *Guinea (Conakry): Reduce excess capacity and strengthen national capacity to promote better international foreign fishing agreements and fisheries trade*

Goal: Improve national capacity to negotiate foreign fishing agreements and develop capacity for sustainable offshore fisheries.

Rationale: Guinea has excess fishing capacity for nearshore stocks. Offshore stocks are heavily exploited by foreign fishing vessels with limited economic or food security benefits to coastal communities. National offshore fishing capacity will be limited while inequitable "Fisheries Partnership Agreements" are made with very efficient, subsidized foreign fishing vessels. Many of these agreements are violated by foreign vessels resulting in unsustainable fisheries and negative impacts on nearshore fisheries and increased food insecurity.

Strategy: Offshore fishing capacity and onshore processing capacity should be developed to benefit Guineans within a sustainable fishing framework. This will require training in the use of modern, but appropriate, fishing methods within the context of a sustainable fisheries management regime. Activities should include expansion of employment and enterprise opportunities for women in fish processing. Technical assistance should be provided to improve negotiation skills to improve the long-term benefits derived from foreign fishing agreements. Guinean monitoring and enforcement capacity should be developed, building on recent work on illegal, unreported and unregulated fishing funded by the United Kingdom's Department for International Development. Enforcement efforts should rely on training in evidence collection, legal procedures, and the use of monitoring technologies (e.g. GPS tracking). Lessons from this effort should be shared with other West African countries faced with similar issues.

20. *Liberia: Promote fisheries as a means to meet basic needs in a post- war society*

Goal: Improve economic development and food security through sustainable fisheries management.

Rationale: As a country emerging from turmoil, sustainable fisheries development could provide employment and food security for Liberia's people. Yet in the current context, fisheries are heavily exploited by foreign fishing vessels.

Strategy: Currently, fish provides only 6% of protein intake for Liberians[7]. Important fishery resources currently exploited by foreign fishing vessels could otherwise provide food and livelihoods to Liberians. The *Food for Peace* and the *Initiative to End Hunger* in Africa (IEHA) should consider fisheries in their programs. An integrated fisheries development, sustainable resource management, and livelihoods development strategy should be the priority, with attention given to women's participation in both resource management committees and livelihood alternatives.

21. *Malawi: Improve fisheries governance through participatory fisheries management, ecosystem management and increased use fish sanctuaries*

Goal: Improve Lake Malawi ecosystem health and restore the lake's fish biodiversity through improved governance and ecosystem-based management.

Rationale: Lake Malawi fisheries have high biodiversity, are heavily exploited and are facing increasing threats from soil erosion and deforestation. The high exploitation of Lake Malawi is eroding the ecological function of the lake and has resulted in the collapse of the tilapia (locally known as *Chambo*) fishery in the more productive southern part of the lake. Fishing effort in the industrial commercial trawl fishery has declined while that of the small-scale artisanal fisheries has increased despite decreasing catch-per-unit effort. The increase in effort in the small-scale artisanal fishery has been exacerbated by increasing fish prices (a 60-fold increase in the last 20 years). The collapse of the tilapia fishery has led to loss of livelihoods and food and nutritional security to millions of Malawians who are dependent on fish as a major source of animal protein. In response to this, the Government of Malawi launched the "National Save the *Chambo* Campaign". The goal of this campaign is to meet the country's obligations to restore fisheries as declared at the World Summit on Sustainable Development and to rebuild production of Chambo to pre-1990 levels. Strategies to restore the Chambo under this campaign are outlined in the Chambo Restoration Strategic Plan (Malawi Government, 2003). The implementation of this strategic plan warrants support.

Strategy: USAID should provide support to the implementation of the Chambo Restoration Strategic Plan in the areas of fish sanctuaries (reserves) design, participatory fisheries management, and natural resource management at multiple scales. Current USAID-supported efforts in community-based natural resource management and natural resource based enterprises should be expanded to include post-harvest technologies and marketing, enterprise development and training for both men and women. In particular, the use of fish sanctuaries to close off areas that were previously open access in order to allow a tilapia fishery should be tested and evaluated. Where these sanctuaries negatively impact the livelihoods of fish-dependent communities, USAID should ensure the livelihood needs of these communities are addressed. USAID should also promote the participation of NGOs in fisheries management activities. USAID should collaborate with on-going efforts by the African Development Bank, WWF and WorldFish Center.

[7] World Resources Institute, earthtrends.wri.org/pdf_library

22. ***Mali: Sustain fisheries and fisheries-related livelihoods in the inner delta of the River Niger, Mali.***

Goal: Sustain fisheries and fisheries-related livelihoods in the Inner Delta of the River Niger, Mali.

Rationale: Capture fisheries are enormously important to the livelihoods of the populations that live along the Niger River, particularly in the inner delta. Official data are scant, but Zwarts et al. (2006) estimate that one-third of the population of the inner delta depend on fisheries for their livelihoods. Fish produced in the delta reach a wider group still—with dried fish in particular representing an important affordable source of animal protein to populations in Mali and neighboring countries. Yet population pressure, conflict over competition for the use of water resources, shifting governance systems and infrastructure development threaten the fishery and the livelihoods associated with it. The role of dams is particularly critical. Improvements to existing infrastructure are more likely to increase economic growth and reduce poverty than building new dams (Zwarts *et al*., 2006).

Strategy: USAID should adopt a four-pronged approach to strengthen fisheries and fisheries livelihoods in the inner Delta of the River Niger in Mali.

- Support efforts to improve information on the *worth* of the fishery (output value, population numbers depending on the fishery, stakeholder analysis, etc.), to help inform investment and policy decisions.
- Support the development of appropriate assessment and adaptive management mechanisms (incorporating a stronger focus on community information and enforcement, to both assess and manage the fisheries).
- Strengthen livelihoods associated with fish trade and processing, working particularly with women's groups, through value chain analysis and market research, business services development, and capacity development for traders/ processors and providers of critical services.
- Support improved health of fishing communities (particularly migrant communities), by working with community groups to strengthen key public health messages and improve access to health services; HIV/AIDS should be a particular focus, given the well-documented susceptibility of fishing communities to HIV/AIDS (Gordon, 2005).

23. ***Mozambique: Improve fisheries governance and capacity development***

Goal: Improve fisheries governance through co-management. Assist with the development of coastal zoning schemes and marine protected areas.

Rationale: Mozambique has important shrimp fisheries and represents the southernmost extension of the East African coral reef systems. As such, it is an important area of unique biodiversity. Efforts in Mozambique could complement the substantial USAID and World Bank efforts in Tanzania and Kenya to create a sustainable fisheries program for large, transboundary ecosystems.

Strategy: The impact of shrimp fishery by-catch is an important issue that can be reduced with technical assistance and policy reform. Co-management strategies that engage government agencies and resources are at early stages of development and warrant additional support. Quirimbas Park, established in 2002, would benefit from technical assistance and implementation planning. Ongoing attention to coastal community needs in relation to the Park is needed, as is careful analysis of the lessons emerging from this experience. There should also be an emphasis on ensuring gender-balanced participation on park and fisheries-related management committees. Clean water, health facilities and microfinance are high priorities for coastal women in Mozambique and could be part of park-community relations. Additionally, the government is close to adopting another large marine protected area known as Primeras and Segundas National Marine Park. Similar opportunities to assist the local authorities could improve livelihoods and fisheries conservation.

Efforts should be coordinated with FAO and NGOs supporting the implementation of marine protected areas in the country. FAO has provided initial technical assistance for shrimp by-catch reduction and initiated a process to support the establishment of an ecosystem-based approach to fisheries for the Southeastern Indian Ocean region. USAID and the U.S. State Department could provide additional assistance for by-catch reduction efforts.

24. *Namibia/Zambia: Expand transboundary freshwater fisheries management for river and lake systems*

Goal: Expand stakeholder-driven fisheries management strategies for freshwater fisheries systems, including transboundary management strategies between Namibia and Zambia.

Rationale: USAID Namibia and USAID Southern Africa have made substantial investments in freshwater fisheries management such as for transboundary management of the Zambezi/Chobe river systems and through community-based natural resources management initiatives. They have also conducted an assessment of these systems that could serve as a useful model for other USAID Missions interested in freshwater fisheries management and for establishing priorities for potential USAID funding. These initiatives are making progress that contributes to bio-diversity conservation goals as well as increased food security.

Strategy: Continue to support capacity development in freshwater fishery management for Namibian institutions, including the Ministry of Fisheries and Marine Resources, Directorate of Resources Management, and expand similar assistance to counterpart Zambian fisheries management institutions. Particular emphasis should be placed on developing and negotiating transboundary management initiatives, stakeholder participation in planning and management as well as replicating relevant successes from the Zambezi-Chovbe project to other freshwater systems in these countries or regionally, including the Okavango River system.

25. *Senegal: Promote sustainable fisheries management, reduction of inter-African nation poaching and open access, and gender-sensitive economic development*

Goal: Reduce the overexploitation of Senegalese fisheries and ensure that Senegalese fishing camps throughout Western Africa do not overexploit fisheries in other countries.

Rationale: West African fisheries are critical for food security and livelihood generation. Senegal has a long standing and important fisheries sector. USAID has had limited experience with fisheries management in West Africa, but some experience in Senegal could be built upon. The Senegalese Department for Marine Fisheries should be assisted in their recent efforts to develop capacity for co-management through the establishment of local small-scale fisheries councils (CLPAs). The World Bank and the Global Environment Facility (GEF) are making significant future investments in the country, investments which USAID could leverage.

Strategy: USAID could support technical assistance in collaboration with the World Bank PROFISH and GEF efforts to reduce excess fishing capacity and fishing effort. Such efforts should be informed by experiences with project FISH in the Philippines and other USAID fisheries programs. Various schemes for effort and capacity reduction (e.g., licensing, boat coding, GPS-based monitoring) should be tested and evaluated in different contexts. When alternative livelihood activities are included with other types of assistance, USAID should ensure that the livelihood needs of both women and men fishers, as well as others dependent upon fishing, are addressed. Careful evaluations of the social, gender and environmental impacts should be conducted to inform other efforts and support adaptive management. USAID should collaborate with ongoing efforts in the region supported by the World Bank, the African Union, GEF, the WWF, the United Nations FAO Investment Fund and Strategic Planning for Sustainable Fisheries. Linkages with the Millennium Challenge Corporation are also possible.

Asia

Fisheries management strategies in this region should build from considerable past experience and USAID investments in fisheries and coastal management in this area. Excess fishing capacity is a key issue for much of the region and is related to weak governance of ocean resources.

26. *Bangladesh: Promote community-based management and livelihood development*

Goal: Expand integrated water and fisheries management programs.

Rationale: The floodplains of Bangladesh are biodiverse and provide significant livelihood and food security services. However, habitats are under increasing pressure from changes in water use and increased habitat transformation. Successful USAID programs such as the *Management of Aquatic Ecosystems through Community*

Husbandry (MACH) program deserve continued support to solidify gains in capacity development and civil society governance.

Strategy: The development of freshwater sanctuaries, which have improved fish intake while maintaining habitat integrity, is a relatively novel approach to freshwater fisheries management. The impact of this strategy should be documented and disseminated to other regions. The ongoing engagement of women in livelihood development, environmental restoration through reforestation, and resource management decision-making bodies should continue to be supported. Given the seasonal flooding and potential for famine due partly to habitat transformation, the *Food for Peace* and other USAID food security initiatives should support sustainable freshwater fisheries management. This model of integrating Title II and natural resource management programs should be shared with other USAID Missions, especially in chronic food insecurity countries.

27. *Indonesia: Develop decentralized governance capacity for fisheries co-management*

Goal: Develop the capacity of local level decision-makers who have been empowered through decentralization to improve sustainable fisheries through co-management.

Rationale: Indonesian fisheries are an important source of livelihood for approximately two million persons. Fish protein is also important for food security. Indonesia has some of the highest marine biodiversity in the world, and it is under severe threat from illegal and destructive fishing, unregulated exploitation for local and international markets, and localized overfishing. Decentralization laws passed in the late 1990s that delegated marine resources management authority to provincial and district government provide an historic opportunity to transform fisheries management and encourage co-management. Progress from previous USAID-supported coastal and fisheries programs has provided small-scale, local-specific examples of how this can be achieved.

USAID has also supported tsunami reconstruction in Aceh, where one of the most impacted economic sectors was fisheries. There has been widespread concern expressed by international experts wanting to ensure that fisheries rehabilitation does not lead to the overcapacity and overfishing situations that existed before the tsunami. There is an excellent opportunity to ensure that fisheries sector rehabilitation is done responsibly and in a manner that corrects past mistakes. One example is the American Red Cross (ARC) livelihood recovery program involving WWF and FAO. This partnership is ensuring that proper environmental guidance is provided to ARC fisheries and aquaculture rehabilitation activities. USAID support for the development of a strategic plan for a local fishermen's association (*Pangimlaot*) is also an excellent example of reconstruction coupled with an example of a socially and culturally appropriate decentralized co-management model.

Strategy: Support the establishment of fisheries co-management through technical assistance to local governments and the establishment of sustainable fisheries

management in critical areas (especially in areas adjacent to marine protected areas). Involve both women and men in co-management committees and in decisions about resource management and livelihoods. Support gender-sensitive strategies for the development of marine-based tourism to help some fisher households exit or reduce dependence on the capture fishery. Ensure that both men and women have equitable opportunities for employment and enterprise development, and that marine-based tourism does not negatively impact women and children via increased prostitution, sexually transmitted diseases and human trafficking.

Continue to support tsunami livelihood reconstruction and ensure that fisheries sector rehabilitation is done in a sustainable manner that does not lead to overcapitalization and overfishing as existed beforehand. Provide continuing technical support to *Pangimlot* and consider expanding this approach to other tsunami-impacted and adjacent areas in Sumatera. Consider participating in the FAO project steering committee for fisheries rehabilitation and providing more technical assistance to fisheries sector rehabilitation efforts.

28. *Philippines: Scale-up management, effort reduction and regional networking*

Goal: Expand and strengthen fisheries management and raise awareness among the public and key policy makers of the need for fishing effort reduction.

Rationale: The county has the most biodiverse marine ecosystems in the world—ecosystems which provide a large portion of the nation's dietary protein. At the same time, there are serious threats to these natural assets from high levels of overexploitation and habitat degradation. Effective co-management strategies linked to decentralization of marine jurisdiction are developing, especially through the FISH program. However, the success of marine protected areas is being undermined by excess fishing capacity, which is one of the most important issues the country needs to address. Fortunately, the Philippines has considerable technical capacity to respond to fisheries management issues.

Strategy: Instigate an inclusive and participatory national dialogue in the Philippines focused on the implications of overfishing in order to support ongoing fisheries reform with an emphasis on reducing excess capacity. Identify gender impacts of overfishing as part of the reform agenda. Monitor and disseminate lessons learned from the ongoing USAID-sponsored FISH Program, and expand the program in terms of geographic scope and length. Support the development of men and women champions for fisheries reform with government agencies so that political will is developed to end open access to marine resources. Expand the impact of more-than-a-decade of USAID investment in coastal and fisheries management by linking Filipino experts with regional initiatives.

29. *Vietnam: Reduce excess fishing capacity*

Goal: Reduce excess fishing capacity by supporting the national government's recent policy commitment to effort reduction.

Rationale: Excess fishing capacity is a leading cause of overfishing and, in turn, poverty and food insecurity in coastal communities in Vietnam. Vietnam has identified the reduction of the number of small-scale fishers operating in nearshore waters as a priority. The government's commitment to address the issue is exceptional, offering the potential to draw lessons of broad relevance for other developing countries in Asia.

Strategy: Improve Vietnamese government efforts to achieve sustainable fisheries, reduce poverty and enhance livelihoods in coastal communities by reducing excess fishing capacity and implementing co-management of fishery resources. Do this by supporting implementation of the Master Plan for Fisheries Development to 2010 and the new Fisheries Law through the design of appropriate implementing strategies and programs to address the challenges of reducing excess capacity and introducing co-management in small-scale, nearshore fisheries. Develop models appropriate for Vietnam that are proven through local pilot experiences and testing a range of approaches, including livelihood alternatives and enterprise enhancement for both men and women. Improve human capacity of men and women at national and local levels for improved nearshore fisheries management by establishment of a "learning network" among government officials, researchers, and resource users. Draw lessons on applicability of this experience internationally, and communicate these results to regional and worldwide audiences.

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Appendices

Several appendices are provided to this report. These are:

Appendix 1: Presidential Memorandum for the Secretary of State and the Secretary of Commerce

Appendix 2: List of Institutions and Individuals Contacted

Appendix 3: Africa's Freshwater Fisheries: An Assessment of Potential Investment Opportunities for USAID

Appendix 4: Capture Fisheries and Gender

Appendix 1 and 2 are provided below. Appendix 3 and 4 listed above can be found electronically on the following website: www.imcafs.org

Appendix 1: Presidential Memorandum for the Secretary of State and the Secretary of Commerce

For Immediate Release
Office of the Press Secretary
October 3, 2006

Memorandum for the Secretary of State and the Secretary of Commerce
SUBJECT: Promoting Sustainable Fisheries and Ending Destructive Fishing Practices
It shall be the policy of the United States, in advancing the interests of the American people, to support the maintenance and use of sustainable fisheries (1) as a source of nutritious food for the United States and the rest of the world, and (2) to meet the needs of commercial and recreational fishing. To implement the policy set forth above, the Secretary of State, after consultation with the Secretary of Commerce, shall:
(1) work with other countries and international organizations to eliminate fishing practices that (a) jeopardize fish stocks or the habitats that support them, or (b) provide a commercial advantage to those who engage in such practices that is unfair in comparison with their competitors;
(2) work within Regional Fishery Management Organizations (RFMOs), and through other cooperative arrangements, to establish rules based on sound science to enhance sustainable fishing practices and to phase out destructive fishing practices;
(3) work with other countries to establish new RFMOs, or other cooperative institutional arrangements, to protect ecosystems in high seas areas where no competent RFMO or other arrangement exists, including calling on all nations to protect vulnerable marine ecosystems by prohibiting their vessels from engaging in destructive fishing practices in areas of the high seas where there are no applicable conservation or management measures or in areas with no applicable international fishery management organization or agreement, until such time as conservation and management measures consistent with the goals of the Magnuson-Stevens Fishery Conservation and Management Act (Public Law 94-265, as amended), the United Nations Fish Stocks Agreement, and other relevant instruments are adopted and implemented to regulate such vessels and fisheries;
(4) work with other countries to develop and promulgate criteria to guide the determination of which marine ecosystems are or are not at risk of damage or loss because of destructive fishing practices; and
(5) work with other countries to combat through enhanced monitoring and surveillance, including through the use of Vessel Monitoring Systems and other technologies, fishing that is unlawful, unregulated, and unreported.
Further, to implement the policy set forth above, the Secretary of State, after consultation with the Secretary of Commerce, shall carry out diplomatic activities for the purposes of (a) ending destructive fishing practices, and (b) promoting rules based on sound science to support sustainable fisheries and to end destructive fishing practices.
As used in this memorandum, the term "destructive fishing practices" are practices that destroy the long-term natural productivity of fish stocks or habitats such as seamounts, corals, and sponge fields for short-term gain.

This memorandum shall be implemented consistent with applicable law and subject to the availability of appropriations. It is intended only to improve the internal management of the executive branch and is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by a party against the United States, its departments, agencies, entities, officers, employees, or agents, or any other person.

GEORGE W. BUSH

Appendix 2: List of Institutions and Individuals Contacted

Institution	Individual(s)
WCS	Tim McClanahan
Conservation International	Leah Bunce, A. Hemphill, Roger McManus
Nature Conservancy	Ian Dutton, Scott Smith, Lynne Hale
Intl. Collective in Support of Fishworkers	Chandrika Sharma
FAO Rome	Serge Garcia and Kevern Cochrane
WorldFish Centre / Headquarters	Steve Hall, Neil Andrew
GEF/LMEs	Andreas Merla
World Bank- PROFISH	Marea Hatziolas, K. Kelleher, L. Glonnevet
Asian Development Bank	Mahfuz Ahmed
Ocean Associates	Lamar Trott
US State Department	Stetson Tinkam, Deirdre Warner-Cramer
NOAA/NMFS/SeaGrant/NOS	Roger Griffiths, R. Lent, Dean Swanson
University of Miami	John McManus
Dalhousie University	Gary Newkirk
Florida State	Felicia Coleman
International Development Research Centre (IDRC)	Brian Davy
GTZ	Peter Jarchau
NORAD	Kirsten Bjoru
Dutch Aid	Peter van der Heijden
DFID	Chris Mees, Tim Bostock
Packard Foundation	Sergio Knaebel
Moore Foundation	Barry Gold
ICSED	Max Aguero
FAOSLAC – Barbados	Bisessar Chakalall
FAO S. America	Francisco Pereira
University of West Indies	Patrick McConney
FISH Philippines	Gerry Sylvestre
Tetra Tech	Alan White
FAO/AP	Derek Staple
SEAFDEC	Magnus Torell
BOBP-IGO	Yugraj Yadava
Mekong River Commission	Kim Geheb
Institute of Fisheries Management	Robin Welcomme
AWF, Lusaka	Joss Sweenenhuis
University of Hull	George Turner
University of East Anglia,	Eddie Allison
NEPAD, Pretoria	Sloans Chimatiro
WorldFish Center, Malawi	Daniel Jamu

Appendix 2: List of Institutions and Individuals Contacted (continued)

USAID Contact	Country/Program
Roopa Karia	Global Development Alliance
Head & Interested Water Team Members	EGAT/NRM/W
-	LAC/ENV
Tim Resch	AFR/ENV
John Wilson	ANE/ENV
Roopa Karia, Robin Mason	Food for Peace and GDA
Margaret Harritt	EGAT/PR
Rene Acosta	Philippines
Anne William, Mac Homer, Azharul Mazumder	Bangladesh
Suzanne Billharz	Indonesia
Winston Bowman	Asia Regional
Richard Edwards	Sri Lanka
Reed Aeschliman	Cambodia
Michael Donald	Dominican Republic
Odalis Perez	Dominican Republic
Lionel Poitevien, Ben Swartley	Haiti
Karen Mcdonald-Gayle	Jamaica
Anne Dix	El Salvador
Jill Kelley	Guatemala
Olive, Steve (TAO)	Nicaragua
Eric R Stoner	Brazil
Connie Campbell	Amazon Basin Cons. Initiative
Escobar, Gabriel	Colombia
Bayle, Bruce	Colombia
Gomes, Josefa	Angola
John Flynn	CARPE Congo
Mark Visocky, Autman Tembo	Malawi
Patricia Skyer	Namibia
Chris Schaan	Reg. Center for South Africa
Holly Ferrette	Bolivia