

fisheries

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The threat of overfishing to inland water bodies

Inland water fishing is an important source of food and income in many developing countries, particularly in rural areas with few job opportunities. But taking too many fish threatens poor people's livelihoods and the biodiversity of aquatic ecosystems.

Overfishing in inland waters is poorly understood. There are no global estimates of the number of people who practice inland fishing, but many inland fish stocks are declining. A report from a coalition of organisations, led by the University of Michigan, USA, examines trends, the state of knowledge and possible responses of the development community and individual countries, regions and villages to the threat of overfishing.

There are two main types of overfishing in inland lakes and rivers. In the first, intensive fishing of a particular species leads to large declines in both numbers and sizes of fish caught. In the second type, known as 'assemblage' overfishing, all types of fish are caught but larger species are selectively

eliminated from catches. This is more common in tropical regions, where fish diversity and the reliance of local people on fish harvests are both high, and a diversity of fishing methods ensures the capture of fish of many types and sizes.

The environmental impacts of overfishing in inland waters are potentially widespread and numerous. The report identifies:

- Overfishing may not always be the single or main threat to water systems, but it can have serious effects when combined with other environmental problems.
- The decline of fish species will affect the long-term nutrient, habitat and ecosystem dynamics of inland waters.
- Overfishing in freshwater systems is likely to be as serious as in marine ecosystems, but receives less attention.

Research into the effects of overfishing on diseases of inland water ecosystems, such as schistosomiasis and cholera, is only just beginning. However, overfishing could seriously impact the health of people in developing countries.

Four principles should guide the management of inland fisheries: the sustainability of yields; the maintenance of biodiversity; protection from other human impacts (such as pollution), and; the provision of livelihood benefits to all consumers of inland fish. To support these,

the research recommends:

- Governments must develop institutions and legal frameworks that increase the participation of all the communities involved in inland water management.
- Local people must become more involved in decision-making processes for managing inland waters.
- River basin management must consider the impact of upstream environmental threats on downstream freshwater systems.
- Fishery management organisations should set cautious targets to protect species from overfishing.
- Fishery management organisations should also assess the effects of fishing on how communities and ecosystems interact.
- Biodiversity conservation and fisheries should be managed together.

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'Overfishing of Inland Waters', *BioScience*, Vol. 55, No. 12, by J. David Allan, Robin Abell, Zeb Hogan, Carmen Revenga, Brad W. Taylor, Robin L. Welcomme and Kirk Winemiller, December 2005 (PDF)
www.aibs.org/bioscience-press-releases/resources/05_December_Article_Allan.pdf

The importance of self-recruiting species

Wild aquatic species are an important resource for poor farmers. However, wild fishing can deplete fish stocks and degrade ecosystems.

Aquaculture (the controlled cultivation and harvest of aquatic plants or animals) is an important industry in the Red River Delta, Vietnam. However, aquaculture often requires cash inputs. This excludes poor farmers who cannot access credit and do not have their own water resources. These farmers often depend on natural, communal water bodies for catching fish and aquatic animals for food and income.

Research from the Research Institute for Aquaculture No.1, Vietnam, analyses self-recruiting species (SRS). These species provide an important source of food and income for poor farmers who are unable to make the necessary investments to establish or maintain intensified aquaculture.

SRS are aquatic animals (such as fish, shrimps, snails and crabs) that farmers can

harvest from natural aquatic systems and do not need regular feeding or re-stocking. SRS:

- occur naturally in communal water bodies and do not rely on human intervention for their reproduction and survival
- provide an important source of animal protein for the diets of poor people
- are an additional source of cash income for farmers who do not eat all the animals or fish they collect.

However, supplies of SRS are being threatened. The intensification of rice farming and increased conventional aquaculture threaten SRS through intensive use of chemicals, destructive harvesting techniques and the eradication of SRS that are seen as pests or predators. Conflict over water resources and changes in land use threaten the ecosystems inhabited by SRS. Furthermore, many aquaculture managers have a limited understanding of SRS systems and fail to recognise the importance of these species to poor farmers.

The research makes several policy recommendations to protect SRS:

- Increase awareness of the importance of SRS by incorporating SRS management and production strategies into fishery training materials.

- Evaluate the impacts of intensifying aquaculture on aquatic ecosystems and develop policies that balance aquaculture with biodiversity protection.
- Identify and legally protect habitats important for SRS.
- Increase poor peoples' access to SRS habitats by giving them ownership and resource use rights.
- Increase research into SRS biology and use this to improve management systems.
- Develop local management approaches that link farmer-managed systems containing SRS, enabling collectors to participate in protecting and managing the species.

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Self-recruiting species (SRS) from farmer managed aquatic systems – are they important to the livelihoods of rural communities? An output of the Research Institute for Aquaculture No.1 project, AGFRP, 2005 (PDF)
www.streaminitiative.org/Library/pdf/PolicyBrief/SRSPolicyBrief.pdf

Experiences from the Fisheries Management Science Programme

There has been increasing interest amongst researchers and policymakers in the potential for co-management to sustainably manage fisheries. However, the complexity, diversity and dynamic nature of fisheries systems present several challenges to those wishing to develop co-management systems.

Co-management refers to a system where different groups are involved in management decision-making. For 11 years, the UK Department for International Development's Fisheries Management Science Programme (FMSP) has commissioned research into fisheries co-management in Africa and Asia. This research has produced a range of tools and methods to support successful co-management. These relate to the challenges of planning, implementing and evaluating co-management at local scales. Together with policy implications for successful co-management, these tools and methods have been synthesised by the FMSP and made available through a series of documents.

Key aspects of the FMSP documents include:

- Frameworks to identify, develop and implement management experiments and data collection systems in collaboration with fishers. These generate information for management decisions.
- Tools to build communications networks and enhance information sharing between researchers, fishers, policymakers and extension staff. These enable stakeholders to access better information for management decision-making.
- Frameworks to evaluate the outcomes of co-management.

Co-management systems and the roles and responsibilities assumed by different stakeholders are context specific. This means that the tools, performance indicators and management actions required will differ between fisheries, and even within the same fisheries over time. Co-management arrangements must therefore be flexible and adaptive: managers should be able to modify their plans during implementation and learn from management outcomes.

A series of lessons have been learned through the FMSP research, specifically on designing, implementing and evaluating local co-management plans. Perhaps the most important issue is how co-management tools and methods are used in different situations. Successful co-management requires:

- a real commitment to identifying and building on the existing strengths of fisheries systems

- transparency amongst stakeholders about the management process
 - fair distribution of the costs and benefits of co-management
 - creating shared authority as well as shared responsibility.
- Other useful lessons from the research include:

- Shared decision-making is central to co-management: all stakeholders must have access to relevant information in a useable form for decision-making to be well informed and fair. This includes local knowledge and information about the social, economic and biological aspects of fisheries.
- Many fisheries systems lack an 'enabling framework' to support co-management. For example, there is no legal recognition of co-management arrangements.
- There are no cross-sectoral policies or support for co-management capacity development, monitoring or enforcement. This can constrain the development of co-management arrangements.

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Fisheries co-management: A synthesis of the lessons learned from the DFID Fisheries Management Science Programme, MRAG Ltd: London, by Robert Arthur, 2005



Fish has always been a mainstay of the Philippine diet, but human population growth has resulted in an over-harvesting of fish and the supply of fish has dropped dramatically. © 2000 Liz Gilbert/David and Lucile Packard Foundation, Courtesy of Photoshare

useful websites

Food and Agriculture Organization's Programme on Fisheries
www.fao.org/fi/default.asp

Marine Resources Assessment Group
www.mrag.co.uk

oneFish
www.onefish.org

STREAM Initiative
www.streaminitiative.org

Sustainable Fisheries Livelihoods Programme
www.sflp.org

WorldFish Center
www.worldfishcenter.org

coming soon

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Reinventing fisheries development: a new international agenda for development action

- The FAO Code of Conduct for Responsible Fisheries
 - Improving the regulation of fisheries
 - Globalisation of the fish trade
 - Fish-farming and aquaculture
 - The NEPAD 'Fish for All' initiative
 - The International Collective in Support of Fishworkers
- For more information, visit: www.id21.org/insights

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