Uganda: Integrated Assessment of Uganda’s National Trade and Fisheries Policies
In January 2004, the Government of Uganda and UNEP embarked on a pilot capacity-building project entitled Integrated Assessment and Planning for Sustainable Development (IAP). IAP was conceived in light of the need to develop the capacity of policymakers to manage the interdependencies among economic, social and environmental facets of sustainable development, with particular focus on poverty reduction, environmental management and sustainable trade promotion.

In Uganda, there have been several attempts to integrate social, environmental and economic aspects into programmes such as the Poverty Eradication Action planning process, the National State of Environment reporting process, and the numerous environmental impact studies linked to various projects and programmes. However, there are gaps in our understanding related to specificity and adequacy of the tools used, stakeholder participation, and human resource capacity to fully assess social, economic and environmental impacts. The IAP project has provided an opportunity to critically analyse these previous attempts and seek ways to close the gaps.

The project’s integrated assessments focused on Uganda’s Draft Trade Policy and the Fisheries Policy. Through ex-ante assessment of the Draft Trade Policy, stakeholders had an opportunity to influence a policy in the making and ensure that social, economic and environmental considerations are taken on board in the final document. Indeed, the-soon-to-be-completed National Trade Policy will support this new perspective. The concurrent assessment of the Fisheries Policy also provided an opportunity for stakeholders to evaluate a policy during its implementation and decide whether it adequately addressed the social, economic and environmental concerns in the sector.

Exports of fish and fish products have emerged as one of the main foreign exchange earners in Uganda, but there is still a long way to go before the sector can measure up to modern fisheries management and related best practices around the world. Furthermore, estimates from the World Health Organization show that most Ugandans are consuming less than adequate amounts of fish. In trying to resolve these issues however, the government should not overlook the economic, environmental and social interdependencies. If emphasis is put on increasing economic rewards from Uganda’s fisheries, then the environmental and social interdependencies need to be assessed and managed. Failure to do so will lead to a fishery industry incapable of sustaining the livelihoods of its dependants.

From this initial foray into integrated assessment and policy analysis, useful lessons have been learnt that should be applied to a wider range of policies. Sector managers need to understand the inter-sector social, economic, and environmental interdependencies, given the need to incorporate views of all stakeholders. Balancing multiple concerns during policymaking and implementation is a big challenge. Economic issues tend to get most of the attention. It is therefore important to continuously evaluate policies under implementation to give the social and environmental aspects the requisite attention.
In conclusion, I wish to thank UNEP for the financial and technical support for the IAP project in Uganda. I also wish to extend my appreciation to the National Technical Steering Committee; the Ministry of Trade, Tourism and Industry; the Department of Fisheries Resources of the Ministry of Agriculture, Animal Industry and Fisheries and all other organizations, stakeholders and individuals whose participation and cooperation have been equally invaluable.

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Executive Director
National Environment Management Authority
# Acronyms and abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AfDB</td>
<td>African Development Bank</td>
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<tr>
<td>BMU</td>
<td>Beach management units</td>
</tr>
<tr>
<td>BOP</td>
<td>Balance of payments</td>
</tr>
<tr>
<td>CEC</td>
<td>Commission for Environmental Cooperation</td>
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<tr>
<td>CITES</td>
<td>Convention on International Trade in Endangered Species</td>
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<tr>
<td>CSO</td>
<td>Civil society organization</td>
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<tr>
<td>DEO</td>
<td>District environment officer</td>
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<tr>
<td>DFR</td>
<td>Department of Fisheries Resources</td>
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<tr>
<td>EAC</td>
<td>East African Community</td>
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<tr>
<td>EIA</td>
<td>Environmental impact assessment</td>
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<tr>
<td>EPRC</td>
<td>Economic Policy Research Centre</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
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<tr>
<td>FIRRI</td>
<td>Fisheries Resources Research Institute</td>
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<tr>
<td>GDP</td>
<td>Gross domestic product</td>
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<tr>
<td>HELI</td>
<td>WHO-UNEP Health and Environment Linkages Initiative</td>
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<tr>
<td>HIPC</td>
<td>Heavily indebted poor country</td>
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<tr>
<td>HSSP</td>
<td>Health sector strategic plan</td>
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<tr>
<td>IAP</td>
<td>Integrated assessment and planning</td>
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<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
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<tr>
<td>ITQs</td>
<td>Individually transferable quotas</td>
</tr>
<tr>
<td>LG</td>
<td>Local government</td>
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<tr>
<td>LMO</td>
<td>Lake management organization</td>
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<tr>
<td>MAAIF</td>
<td>Ministry of Agriculture, Animal Industry and Fisheries</td>
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<tr>
<td>MCS</td>
<td>Monitoring control and surveillance</td>
</tr>
<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
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<tr>
<td>MFPED</td>
<td>Ministry of Finance, Planning and Economic Development</td>
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<td>MOGLSD</td>
<td>Ministry of Gender Labour and Social Development</td>
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<td>MOH</td>
<td>Ministry of Health</td>
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<tr>
<td>MRL</td>
<td>Minimum residue level</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>MSY</td>
<td>Maximum sustainable yield</td>
</tr>
<tr>
<td>mt</td>
<td>metric tonne</td>
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<tr>
<td>MTCS</td>
<td>Medium Term Competitiveness Strategy</td>
</tr>
<tr>
<td>MTTI</td>
<td>Ministry of Tourism, Trade and Industry</td>
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<tr>
<td>MWLE</td>
<td>Ministry of Water, Lands and Environment</td>
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<tr>
<td>NEMA</td>
<td>National Environment Management Authority</td>
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<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
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<td>NPA</td>
<td>National Planning Authority</td>
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<tr>
<td>NPV</td>
<td>Net present value</td>
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<tr>
<td>NTB</td>
<td>Non-tariff barriers to trade</td>
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<tr>
<td>NTSC</td>
<td>National Technical Steering Committee</td>
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<tr>
<td>OECD</td>
<td>Organization for Economic Co-operation and Development</td>
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<tr>
<td>PEAP</td>
<td>Poverty Eradication Action Plan</td>
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<tr>
<td>PMA</td>
<td>Plan for Modernization of Agriculture</td>
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<tr>
<td>PWD</td>
<td>People with disabilities</td>
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<tr>
<td>SBA</td>
<td>Scenario building approach</td>
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<tr>
<td>SEP</td>
<td>Strategic Exports Programme</td>
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<tr>
<td>SNV</td>
<td>Netherlands Development Organization</td>
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<tr>
<td></td>
<td>(Schweizerische Normen-Vereinigung)</td>
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<tr>
<td>STRATEX</td>
<td>Strategic exports</td>
</tr>
<tr>
<td>SWA</td>
<td>Sector wide approaches</td>
</tr>
<tr>
<td>TECCONILE</td>
<td>Technical Co-operation for the Promotion of the Development and Environmental Protection of the Nile Basin</td>
</tr>
<tr>
<td>UBOS</td>
<td>Uganda Bureau of Statistics</td>
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<tr>
<td>UN</td>
<td>United Nations</td>
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<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
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<tr>
<td>UNECA</td>
<td>United Nations Economic Commission for Africa</td>
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<tr>
<td>UNEP</td>
<td>United Nations Environment Programme</td>
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<tr>
<td>UPPAP</td>
<td>Uganda Participatory Poverty Assessment Project</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<td>WTO</td>
<td>World Trade Organization</td>
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Executive summary

The United Nations Environment Programme’s (UNEP) initiative on capacity-building for Integrated Assessment and Planning (IAP) was conceived to further develop a nation’s capacity to integrate the three aspects of sustainable development (environment, social and economic) into the national planning process. At the official launching of the project in September 2004, the National Technical Steering Committee (NTSC)\(^1\) agreed on the following:

- The Draft Trade Policy, which was in the early stages of development, represented the best opportunity for capacity-building and integrated assessment.
- A team of consultants would be hired to pilot the *ex-ante* integrated assessment of the Draft Policy.
- The National Environment Management Authority (NEMA) would guide the project as task manager.
- A stakeholder workshop would be held to review the findings of the pilot study.

At the stakeholder workshop held in August 2005, the consultants presented their findings on the preliminary integrated assessment of the trade policy. Officials from the Ministry of Tourism, Trade and Industry (MTTI) also revealed their progress in developing a comprehensive national trade policy. However, it was agreed that the Draft Trade Policy was still insufficiently developed for consultants to carry out a comprehensive integrated assessment. A simple assessment though revealed that the policy document had not integrated environment concerns. Issues related to the environment were only mentioned in relation to non-tariff barriers, or specifically, anti-dumping and countervailing measures; issues such as sanitary and phytosanitary requirements were not articulated; and the sectors and areas from which trade growth could be envisaged were not mentioned.

Following the workshop, UNEP and NEMA agreed to communicate these initial findings to the MTTI stakeholder workshop as a contribution from the IAP process in development of the Trade Policy. It was agreed that the preliminary integrated assessment report of the Trade Policy be completed, and to also ensure that the integrated assessment capacity-building effort be carried over to the new Fisheries Policy (2004) for a more detailed IAP. The Department of Fisheries Resources (DFR) agreed to work with the IAP NTSC on the integrated assessment.

Assessment of the Fisheries Policy was carried out using the Scenario Building Approach (SBA). Three scenarios were developed: the *slumber fish* scenario (pre-Policy), the *ostrich fish* scenario (current Policy) and the *flying fish* scenario (enhanced Policy). The *slumber fish* scenario depicts the state of the fisheries

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\(^1\) Comprising representatives from the National Environment Management Authority (NEMA), the Economic Policy Research Centre (EPRC) and the Plan for Modernisation of Agriculture (PMA) secretariat, the Ministry of Finance Planning and Economic Development (MFPED), the Ministry of Health (MoH), Ministry of Tourism Trade and Industry (MTTI), the Ministry of Local Government (MoLG) and the Ministry of Water Lands and Environment (MWLE).
management in Uganda before the 2004 Fisheries Policy took effect. Until the new Policy, fisheries were
managed under the Fish Act (1964), the Blueprint for Fisheries Management (1982), and additional policy
documents developed by the DFR. The slumber fish scenario can be brought about by failure to get the new
legislative framework, the draft Fisheries Bill (2005), passed or if the institutional set-up does not match
the aspirations of the policy and, as a result, the regulators fail to get the appropriate financial support,
technical supervision or right set of tools. The ostrich fish scenario is based on successfully implementing
the National Fisheries Policy. This scenario draws on the sustainability indicators, trade-offs and win-win
situations articulated in the strategic objectives of the policy. Should the new Fisheries Policy be implemented
diligently, Uganda’s fisheries will be managed under the assumptions described later in the ostrich fish
scenario. The flying fish scenario represents an enhanced Fisheries Policy, developed from the recent growth
in knowledge and experiences in fisheries management around the world. All three scenarios are projected
to run from 2006 to 2017.

Unsustainable fishing exploitation (over-fishing and destructive fishing practices) and pollution (microbial,
eutrophication and chemical) characterize the slumber scenario. So much so that if fishing practices prior to
the Fisheries Policy are to continue over the projected period (2006 to 2017), per capita fish consumption in
Uganda could fall to 5 kg. Total fish production will remain at 220,000 metric tonnes (mt) per year but illegal
exports will flourish. In 2004, illegal, unreported and unrecorded fish exports were estimated at 60,000 mt.
Effluent from factories in Uganda and Tanzania pose a serious risk to the fisheries through eutrophication
which leads to anoxic conditions, as the more commercially viable Tilapia and Nile Perch are the most
susceptible fish species.

Under the ostrich fish scenario, the Fisheries Policy proposes regular monitoring of minimum residue levels
(MRL), and concentrations of toxic substances and eutrophication. The Fisheries Policy has a target growth
of 100,000 mt per year in aquaculture production for the next ten years, which even compared to the most
optimistic estimate may be out of reach. Instead, a growth of 47,000 mt per year of fish from aquaculture can
be expected. Fish consumption is likely to improve and range between 7.7 kg to 10 kg per capita, less than
the targeted 10 kg per capita. The maximum sustainable yield (MSY) of 330,000 mt per year discussed in
the Fisheries Policy falls well short of the 500,000 mt per year that could be obtained if ecosystem based
approaches of stock enhancement, restocking, and habitat rehabilitation were adopted under the flying fish
scenario.

However, ecosystem approaches under the flying fish scenario are not without danger. If poorly implemented,
they could endanger the very ecosystem they are intended to make more efficient. For instance, ecosystem
manipulation such as artificial habitats may redistribute fish in such a way that encourages over fishing,
pollution, and disruption of structure and functions of the ecosystem such as food provisioning for the
fish. Similarly, population manipulation through stock enhancement may encourage release of individuals
unfit for survival in the wild, weakening of the genetic diversity and introduction of disease. Therefore
in using the ecosystem approach or any other approach that could affect sustainability of the fisheries, the
trade-off should be weighed, using, for example, economic cost-benefit analysis (ECBA) and integrated
assessment. Current estimates indicate that an MSY of 500,000 mt per year will not destroy the resilience of

2 The DFR, fisheries officers, lake management organizations (LMOs) and beach management units (BMUs).
3 Aquaculture is likely to increase by 6 per cent to 8.1 per cent for the rest of the time horizon (Delgado et al., 2003 and
FAO, 2004).
4 A recent study by the National Planning Authority (NPA) and the DFR (NPA, 2006) has revised Uganda’s total fish
production to 430,000 mt, from 330,000 mt, with 416,000 mt the MSY of capture fisheries and 14,000 mt annual
production from aquaculture.
Uganda’s water bodies. However, the flying fish scenario could also lead to pollution due to poor disposal of waste, disease contamination and domination of invasive species over indigenous species. Aquaculture EIA guidelines and economic instruments for aquaculture, especially cage farming, will need to be developed. Under the flying fish scenario, per capita consumption could increase to 11.6 kg per year. Environmental impacts under the ostrich fish scenario will emerge from: over-fishing; by-catch and discards; poor fishing practices such as use of illegal or undersized fishing nets and sinking of fish nets which catches immature and non-target fish species; use of blasting and poison; pollution and deterioration of water quality from industry; eutrophication; and water hyacinth proliferation.

The increased food supply envisaged in the flying fish scenario is expected to increase per capita fish consumption from estimated an 7.7 kg to about 11.6 kg. Women (of child-bearing age) and children stand to gain most from increased fish nutrients such as fatty acids, proteins and minerals, which will reduce child mortality by improving neural development of the foetus and reduce the risk of low birth weight, all key factors in child mortality. Furthermore, improved access and income from the fishery will improve women’s status. Women will have more power within the community as they earn more money to spend on education and healthcare for themselves and their children.

It has been noted in studies (World Fish Centre, 2004 and MAAIF, 2004) that because fishing communities in sub-Saharan Africa and Uganda are among the most affected by HIV/AIDS, fish provides affordable proteins and micro-nutrients that help mitigate the impacts of the disease among the poor. This is because proper nutrition is essential for the effective use of HIV/AIDS drugs. In addition, higher income will enable the infected to obtain further help. Fishermen are five times more likely to die of AIDS-related illnesses than farmers in the Lake Victoria region (FAO, 2004).

Study findings indicate that failure to implement the Fisheries Policy under a slumber fish scenario would jeopardize the livelihoods of 1.2 million people, increasing to 1.8 million in 2017 who rely on the fisheries sector for their livelihood. Approximately 300,000 are likely to be fishers, with 90,000 employed at government, private or civil society level. Another 810,000 people live in fishing communities as net makers, boat manufacturers, fishmongers and as the families of fish subsector employees. The 17 million regular fish consumers in 2004 will grow to approximately 26.4 million people by 2017. This will mean that under the slumber fish scenario, the share of per capita consumption falls to 5 kg.

Up until now, rich fishers may have benefited from the market failures in the short-term, such as bribery during tender allocation, but when fish stocks collapse they too will lose their revenue. Fish processors and exporters will lose the value of their investment in the fisheries industry, all in all a considerable amount, since to start up in fish processing for export requires at least an US$2 million initial investment.

Aquaculture has existed for a long time and yet even by international standards the dangers of intensification of aquaculture are not fully known. Cage farming at Uganda’s major fishery (Lake Victoria) is about to begin and the potential pollution or disease problems need to be considered. There is an urgent need to develop environmental guidelines for investment in intensive commercial aquaculture. In addition, fully exploiting capture fisheries will severely test the resilience of natural eco-systems, which will fail if the capacity is breached. Comprehensive environmental cost-benefit analysis (ECBA) needs to be carried out to ensure that the trade-off is worthwhile.

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5 These are considered internationally to make up 25 per cent of the fish harvested (Delgado et al., 2003), although nationally very few statistics exist on discards apart from commentary by Kaufman (1996) and Nyeko (2005).
The key recommendations from the study are as follows:

- Strengthen capacities of the various levels of government.
- Spend revenues wisely in consultation with the fishing communities and on community projects that lead to human development especially in health and primary education.
- Apply economic instruments to generate both the resources needed for fisheries management and provide the incentives to conduct fishing activities in a responsible manner.
- **Revisit and complete the process of designing an effluent charge mechanism for Uganda’s fisheries and other natural water systems.**
- Ensure benefits to the poor, by focusing on improving access to healthcare, especially maternal healthcare, education and safe drinking water.
- Address the concerns of the losers or the poor fishers who may be disadvantaged by the Fisheries Policy, and the richer fishers who may lose out by surrendering their fishing rights to the communities.
- Engage the private sector.
- Strengthen environmental laws and regulations and promulgate a new principal law for effective fisheries management and utilization and better institutional structure (MAAIF, 2004).
- Improve law enforcement by developing effective law enforcement mechanisms.
- Develop guidelines for Environmental Impact Assessment (EIA) for aquaculture. This should be done urgently so as to precede the anticipated rapid growth of cage farming on the water bodies. The Uganda Investment Authority has already allowed investors to take up their investment sites especially on Lake Victoria.
- Improve stakeholder participation and inter-ministerial coordination to guide sound decision-making at the national level.

In conclusion, the IAP process has succeeded in bringing together stakeholders from a range of government ministries, agencies, NGOs, business associations, research institutes, development partners such as the European Union, the African Development Bank (AfDB), USAID, and private consultants to understand the process of integrating environmental and social issues into economic and trade policies. Another main contribution of this study has been data identification and generation of an assessment process for both the Trade Policy and the Fisheries Policy. Although no changes to these policies are expected immediately, it is hoped that the recommendations will dovetail with the two policies.
Acknowledgements

This publication is based on the results from the Integrated Assessment and Planning (IAP) project implemented in Uganda in January 2004. UNEP would like to begin by thanking their project partner, the National Environment Management Authority (NEMA) for their cooperation and commitment and the Executive Director of NEMA for his leadership and guidance throughout the implementation of the project.

UNEP would like to thank the project’s National Technical Steering Committee for his guidance. Members of the committee include Godfrey Bahigwa, Economic Policy Research Centre, Agaba Friday, Ministry of Health, Ronald Kaggwa, NEMA, Edith Kateme Kasajja, Ministry of Water, Lands and Environment, Cankwo Okullo, Ministry of Tourism Trade and Industry, Angella Rwabutomize, Ministry of Finance, Planning and Economic Development, Yasin Sendaula, Ministry of Local Government, and Godber Tumushabe, ACODE. The Steering Committee also provided valuable guidance and feedback on draft versions of the study.

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An international group of experts provided important input to the project. UNEP would like to express its gratitude to members of this group: Jiri Dusik, Jan Joost Kessler, Barry Sadler and Salah el Serafy for their time, effort, and advice, including comments on the draft version of this report.

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At UNEP, the project was initiated and under the overall supervision of Hussein Abaza. Maria Cecilia Pineda and Fulai Sheng coordinated this project and provided technical support. Desiree Leon facilitated the processing of the report for editing and typesetting. Rahila Mughal provided administrative support for the project.

UNEP’s appreciation also goes to Andrea Smith for editing the report and to Ho Hui Lin of iPublish Pte Ltd for providing editorial and typesetting services.

Notwithstanding the valuable contributions of many acknowledged here, the full responsibility for the content of this report remains with the authors.
United Nations Environment Programme

The United Nations Environment Programme (UNEP) is the overall coordinating environmental organization of the United Nations system. Its mission is to provide leadership and encourage partnerships in caring for the environment, by inspiring, informing and enabling nations and people to improve their quality of life without compromising that of future generations. In accordance with its mandate, UNEP works to observe, monitor and assess the state of the global environment; improve the scientific understanding of how environmental change occurs; and in turn, determine how such change can be managed by action-oriented national policies and international agreements. UNEP’s capacity building work thus centres on helping countries strengthen environmental management in diverse areas that include freshwater and land resource management, the conservation and sustainable use of biodiversity, marine and coastal ecosystem management, and cleaner industrial production and eco-efficiency, among many others.

UNEP, headquartered in Nairobi, Kenya, marked its first 30 years of service in 2002. During this time, in partnership with a global array of collaborating organizations, UNEP has achieved major advances in the development of international environmental policy and law, environmental monitoring and assessment, and our understanding of the science of global change. This work also supports the successful development and implementation of the world’s major environmental conventions. In parallel, UNEP administers several multilateral environmental agreements (MEAs), including the Vienna Convention’s Montreal Protocol on Substances that Deplete the Ozone Layer, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (SBC), the Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention, PIC) and the Cartagena Protocol on Biosafety to the Convention on Biological Diversity as well as the Stockholm Convention on Persistent Organic Pollutants (POPs).

Division of Technology, Industry and Economics

The mission of the Division of Technology, Industry and Economics (DTIE) is to encourage decision makers in government, local authorities and industry to develop and adopt policies, strategies and practices that are cleaner and safer, make efficient use of natural resources, ensure environmentally sound management of chemicals, and reduce pollution and risks for humans and the environment. In addition, it seeks to enable implementation of conventions and international agreements and encourage the internalization of environmental costs. UNEP DTIE’s strategy in carrying out these objectives is to influence decision-making through partnerships with other international organizations, governmental authorities, business and industry, and non-governmental organizations; facilitate knowledge management through networks; support implementation of conventions; and work closely with UNEP regional offices. The Division, with its Director and Division Office in Paris, consists of one centre and five branches located in Paris, Geneva and Osaka.
**Economics and Trade Branch**

The Economics and Trade Branch (ETB) is one of the five branches of DTIE. Its mission is to enhance the capacities of developing countries and transition economies to integrate environmental considerations into development planning and macroeconomic policies, including trade policies. ETB helps countries develop and use integrated assessment and incentive tools for achieving poverty reduction and sustainable development. The Branch further works to improve our understanding of environmental, social, and economic effects of trade liberalization and the effects of environmental policies on trade, and to strengthen coherence between Multilateral Environmental Agreements and the World Trade Organization. Through its finance initiatives, ETB also helps enhance the role of the financial sector in moving towards sustainability.

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1. Introduction

1.1 About the report

This report presents the results of an integrated economic, environmental and social assessment of Uganda’s Draft National Trade Policy and National Fisheries Policy. It aims to improve these policies in such a way that environmental and social concerns are adequately addressed along with the economic and trade considerations. The principal target audience for this report consists of the Department of Fisheries Resources (DFR), the National Environment Management Authority (NEMA), the Ministry of Finance, Planning and Economic Development (MFPED), the Ministry of Gender, Labour and Social Development (MoGLSD), the Ministry of Health, and district governments. In addition, there are other policymakers, legislators, heads of government departments and parastatals, civil society, academics, research institutions, development partners, and the general public who may be interested in the results of the analysis.

The report is divided into four chapters. Chapter 1 provides the background information on this report, the IAP initiative, and Uganda’s socio-economic development and environmental challenges. Chapter 2 describes the Draft National Trade Policy and includes a preliminary assessment of the Draft Policy. Chapter 3 presents the assessment of the Fisheries Policy and Chapter 4 presents the recommendations, conclusions and suggestions for follow-up.

1.2 About the initiative

The National Environment Management Authority (NEMA) together with the United Nations Environment Programme (UNEP) embarked on this capacity-building project for integrated assessment and planning in January 2004. The project was launched nationally in September 2004. Integrated assessment aims to integrate environmental considerations into national planning processes. Internationally, the WSSD Plan of Implementation (2002) highlights the need to encourage governments to take holistic and inter-sectoral approaches to sustainable development. This project reflects a collaborative effort by NEMA, UNEP and other national and international initiatives including the WHO-UNEP Health and Environment Linkages Initiative (HELI).

The original basis for the assessment was the Draft National Trade Policy, which has been under development since 2003. This initial focus responded to the need to integrate environmental and social considerations into the new policy and the trade sector’s Strategic Plan. UNEP (2005) noted that trade creates wealth that could be used to improve human well-being. However, some governments may answer too directly to national industries and try to protect domestic markets for these industries. However, as domestic firms become inefficient and more competitive foreign firms are shut out, domestic consumers pay the price. Uganda has set trade as the engine of growth in the current national development strategy, the Poverty Eradication Action Plan (PEAP). Integrated assessment was seen as an opportunity to improve the Trade Policy in terms of the environment since the efficiency gains from trade can enhance access to efficient and environmentally-friendly technologies.
In addition, this target would offer an opportunity to apply an integrated assessment at every stage of the policy formulation process from inception to the final policy framework. The specific objective of the initiative as originally designed was to ensure that the final version of the Trade Policy reflects and addresses the linkages between trade, the environment and health. This objective would be achieved by using the results from the participatory integrated assessment to guide and inform the design of an integrated National Trade Policy and National Trade Policy Strategic Plan. In addition, it was expected that the process of implementing the project would help raise awareness of the inter-linkages between trade, health and the environment, and build national capacities to design and implement integrated assessment. However, when the Zero Draft of the National Trade Policy was made available for assessment, it was found that the policy was too general and sketchy to be appropriate for a substantive assessment. Thus, after a preliminary assessment of the Zero Draft was completed (see Chapter 2), NEMA and UNEP agreed for the project to continue with an assessment of the 2004 National Fisheries Policy. This assessment was expected to build on the results of an earlier UNEP-supported study on fisheries in 1999. The objective was to improve the Fisheries Policy in support of sustainable fisheries management and poverty reduction.

1.2.1 The project process

The project went through a participatory process. Although the analytical work was contracted to consultants, the project saw stakeholders guiding the project, reviewing the analysis, and considering the recommendations. A National Technical Steering Committee (NTSC) was established, which was multi-sectoral and included the ministries handling health, finance, water, lands and environment, trade, tourism and industry, as well as local government. There was also a representative from the Plan for Modernization of Agriculture (PMA) and a national NGO-Advocates Coalition on Development and the Environment (ACODE). The NTSC met 12 times between January 2004 and November 2005 to coordinate the multiple project activities:

- Background study on the Poverty Eradication Action Plan (PEAP) and other planning processes carried out during the scoping stage. The National Trade Policy was considered an appropriate policy for IAP.
- National workshop to launch the IAP project held in September 2004. The workshop participants agreed to carry out an ex-ante integrated assessment of the Draft National Trade Policy.
- General assessment of the Zero Draft Trade Policy document to assess whether economic, environmental and social concerns of trade had been effectively integrated.
- Workshop on the integrated assessment of the Draft Trade Policy. The workshop revealed that the Ministry of Tourism, Trade and Industry (MTTI) did not have a comprehensive draft but was still compiling policies for the different trade sectors. Rather than integrated assessment, the MTTI was looking for stakeholder consultation.
- Issues paper on policy recommendations for sustainability of Uganda’s trade sector as an outcome of the integrated assessment developed and presented to MTTI as contribution to further development of the Trade Policy.
- Analysis of the economic, social and environmental impacts of the National Fisheries Policy using scenario modelling. Three scenarios were developed - the slumber fish scenario, the ostrich fish scenario and the flying fish scenario.
- Discussion between the consultants and NTSC of the first report on the scenarios built for the National Fisheries Policy.

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6 Bahiigwa et al. (1999).
7 NEMA, the Economic Policy Research Centre (EPRC) and the Plan for Modernisation of Agriculture (PMA) secretariat, the Ministry of Finance Planning and Economic Development (MFPED), the Ministry of Health (MoH), Ministry of Tourism Trade and Industry (MTTI), the Ministry of Local Government (MoLG) and the Ministry of Water Lands and Environment (MWLE).
• National Fisheries Stakeholder workshop to discuss the findings of the integrated assessment of the National Fisheries Policy.
• Final Integrated Assessment Report on the National Fisheries Policy of Uganda.

1.3 Overview of Uganda’s economy, trade and the fisheries subsector

After a robust beginning in the 1960s when the per capita gross domestic product of Uganda was on par with Thailand and South Korea, the country’s economy nose-dived in the 1970s and early 1980s due to civil war and serious macroeconomic mismanagement. Since the late 1980s and early 1990s, the country has made a remarkable resurgence.

Figure 1: GDP by sector at constant 1997/98 prices for FY 1999/00 to 2003/04

Source: Adapted from UBOS, 2003

In the 1990s, Uganda’s GDP grew at an average annual rate of nearly 7 per cent, with the greatest contributions from the agricultural sector, which includes crops, livestock, fisheries and forestry (Figure 1 shows the sectoral contributions to GDP). The most important export during that period was robusta coffee. Since 1998/99, however, real GDP growth has slowed down to about 5.5 per cent a year, the result of a collapse in the price of robusta coffee. Uganda’s trade deficit has also been growing, reaching US$712 million in 2003/2004. (Figure 2 shows the contributions of exports and imports to GDP.) In addition to the trade deficit, Uganda also has a debt problem. In 2000/01, even after the debt relief, Uganda’s debt still stood at US$45 million, about 11-12 per cent of the country’s export earnings.
Historically, Uganda has relied on traditional exports of coffee, tea, tobacco and cotton as major export earners. By 1997/98, coffee still contributed 59 per cent of export earnings. However, in 2001/02 the share of coffee in the value of exports dropped to 19 per cent. The collapse of coffee revenue was compounded by the low export base of a few traditional exports. To counter this dependence on traditional agricultural exports, which in turn led to a volatile and declining export sector, the Government put in place a Strategic Export Programme (SEP). The SEP extended support to traditional and non-traditional exports such as horticulture, fish and livestock. Subsequently, as the value of traditional exports declined and the value of non-traditional exports rose, the shortfall in traditional commodities was bridged. By 2001 non-traditional exports had overtaken traditional exports (as shown in Figure 3). In fact, the best export performance was observed in Uganda’s fish subsector followed by horticulture.
1.4 Poverty reduction

The economic recovery in Uganda which began in 1987 has contributed considerably to poverty reduction. The proportion of Ugandans living below the poverty line had declined from 56 per cent in 1992, to 35 per cent in 2000 before rising slightly again to 38 per cent in 2003 (MFPED, 2003). The measurement of poverty in Uganda is described in the Box 1 below.

Box 1: Measuring poverty in Uganda

Households whose real expenditure per adult equivalent falls below a given level, the poverty line, are considered poor. The poverty line used in Uganda is an absolute, not a relative one. It measures the level of expenditure needed to secure basic food consumption needs (taking into account regional variations in food prices) and a corresponding level of non-food consumption. Poverty can be measured by the headcount, the proportion of people below the poverty line, or by the poverty gap and depth of poverty, which also takes into account the distance below the poverty line. At the moment it is believed that about 38% of the people in Uganda depend on US$1 or less for their livelihood daily.

Source: (MFPED, 2004)

Analysing the dynamics of poverty, Lawson and Okidi (2003) found that a core number of households still remained in chronic poverty while a substantial number of households in Northern Uganda slipped back into poverty in 1992, as a result of the insurgency (see Figure 4).
One reason, as stated in the Poverty Eradication Action Plan (PEAP), why households fell back into poverty was an increase in the numbers of displaced people in northern and eastern Uganda as a result of increased insecurity. There was a major shift of household heads out of agriculture, accompanied by a large drop in home-produced food increase in consumption of purchased food. Poverty increased markedly for households engaged in crop agriculture, especially as the prices of traditional commercial crops such as coffee collapsed. On the other hand, there were factors which enabled households to move out of poverty, including employment, multiple income sources, access to land/property, education/literacy, start-up capital, petty trade (women), surplus production and good prices (MFPED, 2003).

As part of efforts to address poverty in the framework of sustainable goals, the UNEP project “Strengthening environmental policy and management capacity at the national and local levels as a contribution to poverty alleviation and sustainable development in Africa” is also underway in Uganda as well as six other African countries: Kenya, Tanzania, Rwanda, Mali, Mauritania and Mozambique (NEMA 2005). Studies to review the existing poverty reduction policies, plans, programmes and projects for their ability to address environmental concerns, and a monitoring and evaluation framework for poverty and environmental indicators, are being developed.

Uganda’s current outlook for economic growth, articulated in the PEAP, emphasizes trade as the main engine of growth and poverty eradication, and proposes to reduce poverty to 10 per cent by 2017. If poverty reduction were determined by the value of exports (see Figure 5), holding other factors constant, and if it were to decline from 38 to 10 per cent, the value of exports would have to increase by US$688.68 million between 2002 and 2017, reaching a total value of US$1,657.68 million from a base of US$467.6 million earned in 2002. This is an average exports growth rate of 6.24 per cent per year.
With the current low export growth rate at less than 2 per cent, the poverty reduction target may not be accomplished. There is thus a need to create conditions that favour foreign and domestic direct investment and for policies that can identify key growth areas and discover new streams of revenue. An alternative is policies that maintain revenue and lead to exponential export growth above and beyond the current stagnant export growth\(^8\).

\(^8\) The authors propose a separate study to accurately estimate growth in economic indicators required to achieve a poverty rate of 10 per cent by the year 2017.
1.5 **Environmental challenges**

Uganda’s favourable climate, as well as freshwater and biodiversity resources are under threat from mainly anthropogenic activities. The main environmental challenges the country is facing are:

- Increasing climatic variability
- Pollution of surface and ground water bodies
- Land degradation and soil nutrient loss
- Loss of biodiversity through habitat alteration
- Over-harvesting of natural resources.

Despite the existence of a comprehensive set of environmental institutions, policies and laws, the challenge still persists largely due to weak enforcement and poverty. The poor are both victims and agents of environmental degradation. Soil erosion and the subsequent loss of soil nutrients is the main source of environmental degradation, accounting for over 80 per cent of the annual costs, which Yaron, Moyini and others *et al.* (2003) estimate at US$625 million. This translates into a per capita present value environmental debt of about $210 (as of 2002).

**Box 2: The environment, economic growth and poverty reduction in Uganda**

In contributing to the national poverty reduction strategy (PEAP) revision, Yaron and Moyini (2003) estimated that the environment and natural resource sector (land, soil, wetlands, meteorology, forestry and fisheries) contributed an annual economic value of US$17,260 million. This was approximately US$70 per person given Uganda’s population at the time. The estimates were developed from earlier studies by the International Food Policy Research Institute (IFPRI) on Uganda’s land and soil resources and an assessment of Uganda’s fisheries by Banks (2003). The contribution of fisheries alone was estimated at US$301. The report noted that about half of the contribution from the environment and natural resource (ENR) sector is actually captured in Uganda’s GDP statistics, and that the GDP would be at least 7 per cent higher if these values were reflected.

*Source: Yaron, Moyini and others (2003)*

In the fisheries subsector, the major challenge is over-fishing and destructive fishing practices. It is believed that destructive fishing practices have contributed the most to the low fish catches. A second major threat to the sustainability of both capture fisheries and aquaculture is pollution. The eutrophication and algal blooms create areas which are anoxic within the lake, and chemical use also affects the minimum residue levels (MRL) accepted for export fish.
2. Preliminary Assessment of Uganda’s Draft National Trade Policy

Uganda’s policy on trade aims to contribute to poverty reduction through the promotion of employment, economic growth, export diversification (particularly non-traditional exports) and vertical diversification achieved through further processing of, or adding value to primary export products.

For the past several years, Uganda has not had a comprehensive National Trade Policy because the responsibility for setting trade policy was retained by the individual sectors where the trade was generated. For instance, agriculture, mining and wildlife and tourism sectors used to meet “one-on-one” with officials from the Ministry of Tourism, Trade and Industry (MTTI) and the Ministry of Finance, Planning and Economic Development (MFPED) to debate on the individual sector policies. The practice now is for sectors that generate trade to share information with the MTTI. This is particularly the case with the agricultural sector, including the fisheries subsector. Therefore, the new effort to develop a National Trade Policy began with consultations with individual sectors and compilation of the disaggregated documents into one unifying Zero Draft National Trade Policy. The IAP effort coincided with the formulation stage and sought to add input to the Zero Draft.

Figure 6: Sectoral policy cycle

Source: NEMA, 1998
The Zero Draft National Trade Policy proposes the following objectives:

- Promote competitiveness and raise efficiency in domestic production
- Increase the integration of Uganda into both the regional and global economies
- Stimulate domestic and foreign investment in export-oriented activities
- Promote the diversification of exports of goods and services
- Ensure the benefits of the growth and diversification of the traded goods sector are broadly distributed, with the explicit intention of reducing poverty.

In order to contribute to the achievement of the long-term objectives outlined above the Government will pursue the following strategies:

- Develop and sustain strong private and public sector trade promotion institutions
- Improve the production of and access to accurate data and information on trade and market conditions in Uganda and export markets
- Stimulate value-added on existing primary exports
- Support both import growth and long-term trade and payments balancing
- Promote and facilitate the competitive supply of quality consumer goods from Uganda and abroad
- Improve the capacity to analyse the effects of trade developments on domestic activity, household incomes and poverty.

2.1 Analysis of the draft policy

The Draft National Trade Policy recognizes the important linkages between trade and other sectors or issues, in particular, the links drawn to poverty eradication, the agricultural sector, competitiveness, monetary and fiscal policy, investment policy, the manufacturing sector and the service sector. On environmental, social and economic interrelationships, the Draft document acknowledged that exports are mainly from the produce of poor farmers. The produce is exported both in raw and processed form. Hence, the effect on farmers was considered in terms of the price they receive for their produce and the price of the inputs they buy. The Draft also observed the lack of uniform quality standards, price setting, low volumes of trade, limited purchasing capacity and poor quality products as weaknesses in the domestic market. Moreover, there are consequences on the relative prices received by farmers that come from non-tariff barriers in the export markets. Particularly significant are the standards and quality assurance requirements in foreign markets. With this in mind, the Draft document recognized that development of a competition policy was a necessary counterpart to the trade policy. The Draft document further suggested keeping tariffs on frequently used imports as low as possible or at zero in some cases. The policy continues to emphasize the need to:

- Build capacity of competent personnel for international trade relations
- Restructure and strengthen existing trade-related institutions
- Establish a warehouse receipt system and an agricultural commodity exchange
- Encourage regional trade.

The Draft noted the role of Non-Tariff Barriers (NTBs) in trade that could be used to reduce imported substances that lead to pollution and dumping, or are a threat to health, or could damage the environment, or reduce the competitiveness of domestic producers. This provision is covered broadly by the World Trade Organization (WTO) General Agreement on Tariffs and Trade, and more specifically by the WTO Agreement on Anti-Dumping and the Agreement on Subsidies and Counterveillance. The East African Union regulations on imported goods under the Customs Union already bar entry of such commodities.
The Draft did not address how the additional production would occur (i.e. through increased use of fertilisers and land area) and what strain the additional production would have on natural resources and the environment. If fertilisers and other inputs, including inputs for the manufacturing sector, were available in higher quantities, what are the likely environment and health concerns? Are the measures currently in place enough to forestall any negative outcomes and enhance the positive outcomes? If there are any negative outcomes, how will they be discovered and measured? Are there ways of safeguarding or minimizing the impacts? How effective will the NTBs (anti-dumping and countervailing measures) be on their own be in ensuring that increased trade will not be at the expense of the environmental or social aspects of society?

The Draft observed that the current pattern of production was largely based on exploiting natural resources. It therefore sought to strengthen the performance of industry by proposing a number of measures, which are creation of an industrial sector that is capable of continuously upgrading and growing in a competitive global environment; development of strong linkages between industry and agriculture; improvement of the capability of firms to increase production and improve quality; increase Uganda’s share of the global market for industrial exports; provide a platform for new economic growth derived from the industrial sector; generate employment and encourage skills development.

In articulating these demands and the surrounding factors that drive industry to take up the outputs of other production sectors, the Draft Policy failed to shed light on the key issues. For example, the suppliers of raw materials for industry (e.g. fishing communities, farming villages and mining localities) bear the brunt of environmental degradation and health problems, which raises questions that the supply side of trade cannot be sustained. The Draft places emphasis on industry, which may itself violate the environment and natural resources upon which it depends, and leaves the market chain for raw materials to other government policies.

Initiatives such as Export Promotion of Organic Products from Africa (EPOPA) and others run by local organic producers under the umbrella organization National Organic Movement of Uganda (NOGAMU) have enabled poor producers to access international markets. In fact, over the last few years NOGAMU has proposed that Uganda develop a Trade Policy that has a strong position on export of organic and environmentally sustainable products. This approach has been proposed in some circles because Uganda may not be as competitive as other countries that produce large-scale conventional (non-organic) horticultural products such as bananas and pineapples. However, no mention was made in the Draft document of an organic or sustainable products strategy.

Three tools were applied to analyse the Draft Policy. First, a Preliminary Assessment of the coffee, fish and mining subsectors was carried out. The sustainability values were identified, as were current problems and risks, future problems, spatial trade-offs and winners and losers. Second, a Root Cause Analysis (RCA) for the coffee, fish and mining subsectors was piloted using the Pressure–State–Response Model to draw out linkages among the problems, their root causes and associated actors at the local, national and international level. Third, a preliminary Strategic Environmental Assessment (SEA) framework was developed for the fish, coffee, cotton, livestock and mining subsectors. The findings of these analyses are provided in the Annexes.

2.2 Conclusions and recommendations

Several groups, especially national and international non-governmental organizations (NGOs) such as Oxfam and the national NGO umbrella body Development Network of Indigenous Voluntary Organizations (DENIV A), complained about the low level of stakeholder consultation while the policy was being drafted.
Evidence from the policy document itself and the IAP stakeholder workshop showed that there was some justification to this complaint. The Ministry of Tourism, Trade and Industry (MTTI) needs to broaden its consultation base and should consider the approach taken by other government ministries. NEMA should consider carrying out an integrated assessment of the Trade Policy at a later stage when the Government’s position has been further articulated. While this preliminary integrated assessment turned out to be more of a consultative workshop for MTTI, and given the importance of the trade policy emphasizing that “trade is now considered the engine of economic growth”, conducting a full integrated assessment on a more developed policy in the future will be of considerable benefit to policymakers and stakeholders.

There is a need to conduct economy-wide policy assessment studies to identify the societal sectors and groups, natural resource sites and the environments most likely to bear the brunt of trade policy proposals. From these assessments, alternative measures should be proposed that will not only help direct the review of Uganda’s Trade Policy but also guide the country’s position at WTO and other multilateral and bilateral trade negotiations.

The most recognizable interrelationship mentioned in the Draft Trade Policy in relation to the environment concerned the NTBs (dumping and countervailing measures). However, the Draft failed to define the sectors on which Uganda’s trade would be hinged, or what were the most important sectors to the economy, or the types of incentives that were being proposed for the different sectors, such as where final good production or raw material production would come from and whether local inputs or imports would be used. The trade policy document also failed to mention Uganda’s position on the export of organic and sustainable products.
3. Assessment of Uganda’s National Fisheries Policy

3.1 Overview

3.1.1 Evolution of the policy

The National Fisheries Policy (2004) was developed in recognition of the concerns by several stakeholders that Uganda’s fisheries subsector operated without an explicit national policy. It was argued that the lack of such a policy had stifled investments in the fisheries subsector and led to uncoordinated development in the public sector. Furthermore, Uganda embarked on a Decentralization Programme in 1997. Decentralization shifted governance of local resources from the national institution (Ministry of Agriculture Animal Industry and Fisheries, MAAIF) to local governments. Indeed, several natural resource subsectors (Forestry, Lands and Water) foresaw a clash in the management and took steps to improve the relationship between the central government ministries and the local governments. The fisheries resource managers needed a policy to streamline their own oversight of the fisheries. Moreover, Uganda as a member of the international community had signed onto a number of international and multilateral environmental agreements (MEAs) such as the Convention on Biodiversity (CBD), the Treaty for the Establishment of the East African Community, the Convention on Trade in Endangered Species (CITES) and several other agreements. The fisheries policy therefore represented an opportunity to underline Uganda’s commitment to its international obligations. Supporting legislation has come from Statutory Instruments, which will be strengthened by the Fisheries Bill (2004) when passed. The Policy is being implemented through the Fisheries Sector Strategic Plan.

Formulation of the Policy began in earnest in 1999. A draft was produced in 2000 to facilitate wider consultations and Cabinet adopted the final policy version in 2004. Impetus to formulate a new national policy on fisheries arose from the following observations:

- Stocks of important commercial fish species were declining.
- Uncontrolled access to the resource and increased population was exerting tremendous pressure on the fisheries resources in the absence of effective government oversight.
- Increased pollution load and siltation of aquatic systems as a result of increased population in the catchment area and urbanisation.
- Biodiversity of the fisheries resource had been affected by the introduction of non-endemic fish species and alien aquatic species such as the water hyacinth.
- Demand for quality fish by foreign and domestic markets was becoming more stringent.
- Administration of the Fisheries subsector\(^9\) was characterized by a lack of community participation and operational oversight which led to inadequate enforcement levels.

\(^9\) The Fisheries subsector is part of the broader, administratively defined, Environment and Natural Resources (ENR) Sector.
• Processing and export of fish were beginning to dominate private sector investment in the fishing industry.
• There were frequent fish bans in the domestic and foreign markets adversely affecting trade in fish.
• New policies such as the Decentralization Policy, Civil Service Reform, the Poverty Eradication Action Plan, the Plan for Modernisation of Agriculture and the 1995 Constitution of the Republic of Uganda have all had influence on fisheries activities thereby necessitating revisions or the introduction of new sectoral policies including that of fisheries.
• Budgetary allocations for fisheries resources management were very low, and constrained the implementation of plans in the subsector.
• The law governing fisheries management (Fish Act, 1964) was outdated and in need of revision.

3.1.2 Aim of the policy
The aim of the new policy is to provide an overall national vision for the development of the fisheries subsector and bolster it by prescribing institutional arrangements for management of the subsector and identifying relevant stakeholder institutions that will support implementation and address current concerns.

The overall vision for fisheries in Uganda is:

“...an ensured sustainable exploitation of the fishery resources at the highest possible levels, thereby maintaining fish availability for both present and future generations without degrading the environment.”

The fisheries subsector goal is branched into thirteen strategies, outlined in Box 3 next page.
Box 3: National Fisheries Policy Areas

National Fisheries Policy Areas/Statements

The overall goal of the fisheries subsector is to ensure increased and sustainable fish production and utilization by properly managing capture fisheries, promoting aquaculture and reducing post-harvest losses. To achieve this goal, the policy has set forth the following thirteen objectives and strategies:

1. Sustainable management and development of fisheries – social, economic and environmentally sustainable use and development of the resource
2. Decentralization and community involvement in fisheries management – devolution of some decision-making responsibilities to local governments and communities
3. District, sub-county and community cooperation in fisheries management – cooperation between districts, sub-counties and communities in the management of shared fisheries and aquatic ecosystem
4. Institutions and funding mechanisms – development of sustainable institutions and funding mechanisms for improved fisheries management
5. Investment in fisheries – promotion of public, private sector and community-based investment in fisheries
6. Planning and policymaking – use of participatory planning and policymaking approaches in fish resource management
7. Information – effective generation and use of information
8. The environment and fisheries – minimization of adverse environmental impacts and establishment of mechanisms for accomplishing this
9. Aquaculture – increase aquaculture production to bridge the gap between demand and supply
10. Post-harvest fish quality and added value – improve quality, wholesomeness and safety of fish for human consumption and value of the fish
11. Fish marketing and trade – achieve sustainable increases in the volume and value of fish marketed
12. Human resource development – promote comprehensive training and advisory programmes
13. Research – social, environmental and technical investigation of fisheries resource issues including development of appropriate technologies and responsiveness to the needs of the industry.

Source: DFR (2004)

The Fisheries Policy targets fishers and fishing communities, fish processors and exporters, fish consumers, fishmongers, fishing net makers, boat manufacturers and fish resource users. In 2004 it was estimated that up to 1.2 million people based their livelihoods on fisheries resources (MFPED, 2004). This population will grow by 3.4 per cent to an estimated 1.8 million people by 2017, although the policy has proposed to reduce the number of fishers to ensure sustainability.

The Fisheries Policy also attempts to increase women’s rights of access to at least 30 per cent and encourage an equal stake in the management of the fisheries. The Policy envisages that by through women, children are also indirectly targeted and gain better access to healthcare, nutrition and education. Indigenous communities are also among the intended beneficiaries, especially the poor that have been losing out to richer fishers. They can now apply for tenders with the local government administration. The poor will be empowered to look after their resource and have a platform to debate how it should be managed.
The Fisheries Policy also targets fish consumers, who now have a greater awareness of safety concerns, sanitary and phytosanitary standards, and meets the need to increase catch volume as the population grows. By increasingly focusing on the importance of aquaculture, private investors will be attracted to a fish farming management system where they will have better control over resource investment and predict inputs and outputs with greater accuracy. Investors will have a greater level of integration by producing, processing and exporting the fish, which will save costs and increase their profits.

The National Constitution of 1995 provided the overall policy framework for the National Fisheries Policy. Paragraph (xiii) of the National Objectives and Directive Principles of State Policy places an obligation on the State to protect important natural resources, including land, water, wetlands, minerals, oil, fauna and flora, on behalf of the people of Uganda. The Constitution, together with the Local Governments Act 1997 (GoU, 1997, gives legal meaning to decentralized environment and natural resources management. Based on these institutional instruments, fisheries resources management is the primary responsibility of local governments while the centre provides policy guidance, and sets and enforces standards, among others activities. In addition, there are a number of other instruments (summarised in Box 4 below) that are closely linked to the Fisheries Policy.

**Box 4: Other policies related to the Fisheries Policy**

- The *Plan for the Modernisation of Agriculture* (PMA) is a multi-pronged plan addressing both the supply and demand side issues in agriculture. The National Agricultural Advisory Services (NAADS) is a part of PMA dealing with mainly extension service. Fisheries, especially fish farming is one of the activities included in NAADS.

- The cooperation agreement of the *East African Community* (EAC) through its *Lake Victoria Fisheries Protocol* governs the management and sustainable utilization of the fisheries resources of Lake Victoria. Likewise, the *Lake Victoria Environment Management Project* (LVEMP) has fisheries management and research as one of its components.

- *The National Environmental Management Policy* (1994) aims at facilitating a comprehensive and coordinated approach to solving environmental problems in Uganda. The policy emphasizes the need to conserve biological resources including fisheries.

- *The Wildlife Policy* (1995) recognizes fishes as a form of wildlife. The objective of the Wildlife Policy is to ensure the perpetuity, for Ugandans and the global community, the wildlife resources within and outside the protected areas and to enable the people of Uganda derive benefits from wildlife. The policy developed instruments for managing fisheries resource under the management of the Uganda Wildlife Authority (UWA). In so doing, the policy created strong links associated with exploitation of wild fish species.

- *The National Wetlands Policy* was adopted in 1995 and complements the goals and objectives of the National Environmental Management Policy. The aim of the policy is to maintain an optimum diversity of uses and users and consideration for other stakeholders when using the wetland.Wetlands are habitats as well as breeding and nursery grounds for fish.
• The Plan for the Modernization of Agriculture (2000) is built on the overall national objective of poverty reduction through increasing household income. The Plan takes cognisance of full macroeconomic policy objectives and aims at giving the rural household farmer, including the fisher folk, a better standard of living. The plan identifies and prioritizes a number of key areas for government interventions in the medium term. The plan provides a strong supportive environment for the National Fisheries Policy.

• The Water Policy (1995) takes into account economic liberalization, privatization and decentralization reforms. It recognizes good quality water for the growth of the water biota including fish.

• Public Sector Reform (2002) where Government has committed itself to public sector reform in its recent restructuring of government ministries or departments. Restructuring in MAAIF including the DFR started in 2005. The efficiency and effectiveness, or lack thereof, of current institutional structures were recognized. The need to strengthen or further transform the current dispensation to encourage good governance, transparency and improve accountability was proposed.

• The Treaty for the Establishment of the East African Community signed on 30 November 1999, groups the three partner states of Kenya, Uganda and Tanzania into the East African Community. Article 114 of the Treaty provides for the management of natural resources and calls on the partner states to foster cooperation in the joint and efficient management and the sustainable utilization of natural resources within the community for the mutual benefit of the partner states. Thereon the partner states agreed to cooperate through the adoption of common policies and regulations for the conservation, management and development of shared aquatic and terrestrial, and in particular fish resources.

• Technical Co-operation for the Promotion of the Development and Environmental Protection of the Nile Basin (Tecconile) 1992 was established by Ministers of Water Affairs in ten countries in the Nile basin. The importance of the agreement is in the reliance on healthy aquatic environments of Lake Victoria, Lake Kyoga and Lake Albert for the fishing industry and it aims to facilitate cooperation in the sustainable joint use and conservation of the waters.

• Convention for the Establishment of the Lake Victoria Fisheries Organization (LVFO) 1994, whose objectives are to foster cooperation among Kenya, Uganda and Tanzania, harmonize national measures for the sustainable utilization of the living resources of Lake Victoria, and develop and adopt conservation and management measures. Given the economic, social and environmental importance of the Lake Victoria fisheries, the National Fisheries Policy must take note of Uganda’s obligations under this convention.

• The FAO Code of Conduct for Responsible Fisheries 1995, adopted by consensus at the 28th Session of the FAO Conference in October 1995. Even though it is not a mandatory Code it has a strong persuasive effect on administrators, policymakers and lawmakers of FAO member states. The Code establishes principles and standards applicable to the conservation, management and development of fisheries. It also covers the capture and processing of trade in fish and fish products, fishing operations, aquaculture and fisheries research.

10 Burundi, Egypt, Ethiopia, Eritrea, Kenya, Rwanda, Sudan, Tanzania, Uganda and Zaire.
The Fisheries Policy was formulated through a participatory process and involved wide consultation with key stakeholders including:

- Line ministry departments, agencies and parastatals
- Local governments
- The East African community
- Riparian\textsuperscript{11} communities
- Civil society (non-governmental organizations and community-based organizations)
- The private sector
- Education, training and research institutions
- Legislators
- Development partners.

Virtually all key stakeholders were consulted during the policy formulation process. It is a requirement of Government that before it adopts a policy, evidence of a wider consultation process must be presented. At issue are the quality and content of the consultations.

### 3.2 Assessment process

Integrated assessment of the National Fisheries Policy was carried out using the Scenario Building Approach (SBA). Scenarios describe events and trends as they could evolve, as narrative descriptions of the future focusing attention on the causal processes and decision points. The Netherlands Development Organization (2004) defined a development scenario as “a rich and detailed portrait of a plausible future state”. Scenarios are a combination of estimates of what might happen and assumptions about what could happen. Accuracy is not the main characteristic of a good scenario, rather it is plausibility, internal consistency (including a description of causal processes) and utility for decision-making.

In this chapter, the SBA is used to evaluate if the three pillars of sustainable development (environmental, social and economic) have been considered equally when formulating the Fisheries Policy. It also examines whether the policy will lead to improved economic performance of the sector when key aspects of environmental and social sustainability have not been improved. In implementing the SBA, the following series of activities is used to guide the narration: (1) selection of scenarios; (2) justification and description of scenarios; (3) assumptions for building scenarios; (4) input indicators into scenarios; (5) output indicators from each scenario; and (6) conclusions about each scenario.

This assessment of the Fisheries Policy was built upon a comprehensive study on the fisheries subsector of Uganda, which was published in 1999 (Bahiigwa et al., 1999). The study made several recommendations, some of which assisted the formulation of the National Fisheries Policy. For example, the National Fisheries Policy advocated a new law to replace the outdated Fish and Crocodiles Act 1964. The Bahiigwa report also recommended conducting a detailed study on the laws governing fisheries and other aquatic resources, and a study was consequently initiated between the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and the Ministry of Water, Lands and Environment (MWLE). The study proposed the introduction of economic instruments to complement the current set of regulations used in the management of Uganda’s water bodies. Unfortunately, the project stalled as coordination between the Ministry of Finance, Planning and Economic Development (MFPED) and the core ministries MAAIF and MWLE collapsed. Bahiigwa also noted that there is no recent comprehensive assessment survey of fish in the various lakes and rivers of Uganda. The last such study covered Lake Victoria and it was conducted from 1969 to 1971. Together

\[11\text{ Riparian areas or zones are the interface between land and water.}\]
with the Centre for Environmental Economic and Policy in Africa (CEEPA), the Department of Fisheries Resources (DFR) of MAAIF is in the early stages of compiling a natural resource account of fisheries resources in Uganda. Other studies on the fisheries subsector concentrated on Lake Victoria with the almost total exclusion of the other water bodies. Generally, previous studies\textsuperscript{12} have recommended the following important steps:

\begin{itemize}
  \item Better and more accurate definition of the maximum sustainable yields (MSY) of fish from the water bodies of Uganda
  \item Detailed studies on the institutional structure and laws governing the fisheries subsector
  \item Additional socio-economic studies
  \item Better understanding of the fisheries-environment link.
\end{itemize}

3.3 Scenario analysis

The National Fisheries Policy makes certain explicit assumptions, which are (1) trade in fish is inherently good, and can be increased sustainably; and (2) the result of the current policy is better than the situation that prevailed before it.

Three scenarios were used in the implementation of the integrated assessment of Uganda’s National Fisheries Policy namely: slumber fish, ostrich fish and flying fish scenarios. All three scenarios are projected to run from 2006-2017.

The slumber fish scenario describes fisheries management before the adoption of the National Fisheries Policy (2004). In this scenario the fisheries are managed under the Fish Act (1964), the Blueprint for Fisheries Management (1982), and additional policy documents developed by the Department of Fisheries Resources (DFR). This scenario depicts the slumber state likely to characterize fisheries management in Uganda should there be a failure to adhere to the new Fisheries Policy (2004). There is a danger that the proposed policy may not take off as expected due to institutional problems such as failure of parliament to adopt the Fisheries Policy, inability to mobilize sufficient resources to implement the policy or a learning failure among key stakeholders.

The ostrich fish scenario is based on fully adopting the current National Fisheries Policy (2004)\textsuperscript{13}. This scenario draws on the sustainability indicators, trade-offs and win-win situations articulated in the strategic objectives of the policy. The fisheries will be managed under a stable scenario should the new Fisheries Policy be implemented to the letter. The assumptions that describe this state of fisheries management are found in Table 1 below.

The flying fish scenario represents an enhanced Fisheries Policy scenario, developed to reinforce the National Fisheries Policy. The scenario is based on the growth in knowledge and experience gleaned both nationally and from other parts of the world, suggesting improvements in fisheries resource management prescribed in the 2004 policy document. The stable fisheries under the ostrich fish scenario could be enhanced into a flourishing and fast-growing fisheries subsector if the Fisheries Policy was enhanced as suggested in the assumptions listed in Table 1 below.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|}
\hline
\textbf{Assumption} & \textbf{Description} \\
\hline
Better and more accurate definition of the maximum sustainable yields (MSY) & \textsuperscript{12} Bahiigwa et al. (1999); Bahiigwa and Keizire (2003); and Banks (2003). \textsuperscript{13} The ostrich depicts a government that does not want to face reality. An ostrich supposedly hides its head in the sand when danger threatens.\hline
\end{tabular}
\caption{Assumptions for the National Fisheries Policy}\
\end{table}
These scenarios are expected to challenge the assumptions and answer a number of questions, including:

- Is adopting the current policy a true and significant improvement over the previous situation?
- What are the economic, social and environmental implications of the current policy?
- Is there a better alternative to the current policy? If yes, how would its economic, social and environmental implications compare to the current policy?

**Table 1: Framework used for building the scenario analysis**

<table>
<thead>
<tr>
<th>1. Fisheries managed on the basis of:</th>
<th>Slumber fish scenario</th>
<th>Ostrich fish scenario</th>
<th>Flying fish scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The Fish Act 1964.</td>
<td>• The Fish Act 1964.</td>
<td>• The Fisheries Policy of 2004.</td>
<td></td>
</tr>
<tr>
<td>• The Blueprint for Fisheries Management 1982.</td>
<td>• The Blueprint for Fisheries Management 1982.</td>
<td>• The Draft Fisheries Bill currently before cabinet for approval and scheduled for parliament to pass as law in 2006.</td>
<td></td>
</tr>
<tr>
<td>• Other additional regulations developed by DFR in the absence of a comprehensive fisheries policy.</td>
<td>• Other additional regulations developed by DFR in the absence of a comprehensive fisheries policy.</td>
<td>• An enhanced Fisheries Policy.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Maximum sustainable yield from capture fisheries</th>
<th>Slumber fish scenario</th>
<th>Ostrich fish scenario</th>
<th>Flying fish scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>• MSY at approximately 300,000 mt.</td>
<td>• MSY set at 330,000 mt per year as specified by the Fisheries Policy (2004).</td>
<td>• MSY assumed to grow up to 500,000 mt through better management and utilization of more species and water bodies.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Aquaculture</th>
<th>Slumber fish scenario</th>
<th>Ostrich fish scenario</th>
<th>Flying fish scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Very little aquaculture exists. Middle-income households produced for subsistence consumption.</td>
<td>• Aquaculture grows at a fast rate per annum and the target is 100,000 mt by 2017.</td>
<td>• Intensive aquaculture to boost production to meet growing demand.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Access to fisheries for women and vulnerable groups</th>
<th>Slumber fish scenario</th>
<th>Ostrich fish scenario</th>
<th>Flying fish scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Only 6% of women have access to the fishery.</td>
<td>• At least 30% of women have access to the capture fishery as provided for in the fisheries policy (2004) and the Draft Fisheries Bill.</td>
<td>• Subsidize low income groups, especially women, who cannot afford to invest in the aquaculture subsector and have limited access to capture fisheries.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Growth of domestic fish demand</th>
<th>Slumber fish scenario</th>
<th>Ostrich fish scenario</th>
<th>Flying fish scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Domestic population is growing at 3.4% per annum which is also the rate of growth of fish consumption nationally.</td>
<td>• Domestic population is growing at 3.4% per annum which is also the rate of growth of fish consumption nationally.</td>
<td>• Domestic demand grows at 3.4%, and international demand will grow to exceed 60,000 mt per annum due to volume growth from export and growth in incomes in Sub-Saharan Africa.</td>
<td></td>
</tr>
<tr>
<td>6. National per capita fish consumption</td>
<td>Slumber fish scenario</td>
<td>Ostrich fish scenario</td>
<td>Flying fish scenario</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>----------------------</td>
<td>----------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>• Lies between 6-10 kg and declining per capita.</td>
<td>• Set to 10 kg in National Fisheries policy (2004).</td>
<td>• Grows to 15.6 kg (FAO, 2004).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. By-catch and discards</th>
<th>Slumber fish scenario</th>
<th>Ostrich fish scenario</th>
<th>Flying fish scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Volume of by-catch and discards unknown but could be about 20% of total harvests (FAO, 2004).</td>
<td>• Volume of by-catch and discards is 20% of quantity harvested based on international averages. There is an industry of processed feeds from fish by-catch.</td>
<td>• Volume of by-catch and discards continually monitored and punitive charges are used to regulate it. Incentives also used to encourage lower levels of by-catch and utilization of by-catch and discards.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8. Foreign Direct Investment</th>
<th>Slumber fish scenario</th>
<th>Ostrich fish scenario</th>
<th>Flying fish scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Foreign Direct Investment (FDI) stalls at 9 operational fish factories.</td>
<td>• Number of licensed fish factories increases to at least 20.</td>
<td>• High levels of technology-intensive aquaculture and high-value fish products.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9. Management structure for fisheries</th>
<th>Slumber fish scenario</th>
<th>Ostrich fish scenario</th>
<th>Flying fish scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fisheries managed by the District Local Governments with supervision from DFR.</td>
<td>• The price and demand for Uganda’s fish in the international markets grow with the EU as the major destination for fish. Nile Perch and Nile Tilapia are the major fish exports.</td>
<td>• Ecosystem based fishery practices: gear modification, sweeping for lost gillnets and trap posts, rehabilitation and construction of fish habitats, restocking and stocking enhancement boost capture fisheries.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Award of tenders mired in bribery. Tender winners manage fish landing sites on behalf of the local government. They collect access fees and they remit a percentage.</td>
<td>• The fisheries are managed through communities, Beach Management Units (BMUs) and Lake Management Organizations (LMOs).</td>
<td>• Use of payments for ecosystem services to reward sustainable management of fisheries</td>
</tr>
<tr>
<td></td>
<td>• Right of access: fisheries are managed similar to open access. Small-scale fishers dominate the fishery; rich fishers own several fishing boats and can afford landing site fees. The poor cannot afford to own a boat or the landing site fee.</td>
<td>• Small-scale fisheries dominate the fishery, with a few rich or extremely poor fishers.</td>
<td>• Eco-tourism on biodiversity rich fisheries to exploit other benefits from a sustainable fishery such as sport fishing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Eco-labelling and sustainable aquaculture for specialized markets and unique biological diversity.</td>
</tr>
</tbody>
</table>
## Integrated Assessment of Uganda’s National Trade and Fisheries Policies

<table>
<thead>
<tr>
<th>Slumber fish scenario</th>
<th>Ostrich fish scenario</th>
<th>Flying fish scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Fish Resource Rents</td>
<td>• All resource rents accrue to fish processors and exporters, commercial fishers and fishmongers.</td>
<td>• A charge of 2% resource rents for fish processors and exporters mandatory in the Fish Bill (2005).</td>
</tr>
<tr>
<td>11. Assessment of Environmental Impacts</td>
<td>• Fisheries policy, programmes and projects are subject to an EIA. Enforcement restricted to large projects. Mired with bribes.</td>
<td>• Fisheries policies, programmes and projects will be subject to EIA.</td>
</tr>
<tr>
<td>12. Management of the fisheries resource and enforcement of quality</td>
<td>• Successive breakdown in the management of the fishery and enforcement of quality standards.</td>
<td>• Command and control approaches dominate with little use of market-based incentives except for fish resource rents for fish harvesting.</td>
</tr>
<tr>
<td></td>
<td>• The fishery is considered to be over-exploited with major fishing effort on Lake Victoria and Lake Kyoga and very little elsewhere.</td>
<td>• The DFR monitors toxic chemical levels in the water and MRLs. The Directorate of Water Development of the MWLE, and NEMA enforce water quality standards.</td>
</tr>
<tr>
<td></td>
<td>• Illegal Unreported and Unregulated (IUU) export of fish is rampant and illegal exports continue to proliferate.</td>
<td>• Participatory data collection and database management and use in collaboration with BMUs and other stakeholders.</td>
</tr>
<tr>
<td></td>
<td>• Fisheries managed based on trawl surveys conducted by researchers on Lake Victoria and FIRRI estimated.</td>
<td></td>
</tr>
</tbody>
</table>
3.4 Market analysis

3.4.1 Slumber fish scenario
Total fish production under the slumber scenario can only reach 332,036 mt per year, that is, 330,000 mt as MSY plus 2,036 mt from aquaculture (Banks, 2003). Present records indicate that, on average, only 220,000 mt are actually harvested, with another estimated 60,000 mt smuggled across Uganda’s borders as illegal exports. With production at 282,036 mt, aquaculture is expected to stagnate. With no deliberate government policy to increase or encourage farmed fish production the demand shortfall may be as high as 167,164 mt by 2017 (see Table 2). Before 2017, with demand increasing and production inefficient, fishermen could still employ capture techniques that lead to much lower catches with the risk of depletion of stocks. In the long run, the price of fish will be very high for domestic consumers and even the processors and exporters. Demand will be much higher than supply. This situation will boost production in the crop-based protein and beef sectors and increase prices for these two sectors in the short term. But with greater production in the medium and long term the prices may be lower.

Table 2: Projected and most likely fish production and consumption statistics of the slumber fish scenario

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic per capita consumption (kg)</td>
<td>7.7</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Aquaculture production (mt)</td>
<td>2,360</td>
<td>Not stated</td>
<td>2,360</td>
</tr>
<tr>
<td>Total recorded production by volume (mt)</td>
<td>222,600</td>
<td>Not stated</td>
<td>&lt; 222,600</td>
</tr>
<tr>
<td>Exports (mt)</td>
<td>0,000</td>
<td>0,000</td>
<td>&lt; 0,000</td>
</tr>
<tr>
<td>Maximum sustainable yield (mt)</td>
<td>300,000</td>
<td>300,000</td>
<td>&lt; 300,000</td>
</tr>
<tr>
<td>Illegal unreported unregulated exports (mt)</td>
<td>60,000</td>
<td>0</td>
<td>60,000</td>
</tr>
</tbody>
</table>


3.4.2 Ostrich fish scenario
The ostrich scenario projects that if Uganda’s long-term fish consumption is maintained at 10 kg per capita and the national population grows to 32 million people by 2015, domestic demand for fish will be 320,000 mt per year. When the maximum allowable export per year of 60,000 mt is added, the total fish demand will reach 380,000 mt per year. However, the policy recognizes that the maximum sustainable yield (MSY) of capture fisheries is only 330,000 mt per year. Therefore there will be a shortfall of 50,000 mt per year. The National Fisheries Policy proposes to fill this gap by increasing aquaculture production from the levels of 2,036 mt per year to 100,000 mt per year over 10 years (Banks, 2003).

It should be noted, however, that a recent study by the National Planning Authority of Uganda and the Department of Fisheries Resources (NPA, 2006) re-evaluated upwards Uganda’s fisheries stocks from 330,000 mt, a figure referred to in the National Fisheries Policy to 430,000 mt. The new MSY for capture fisheries is now considered to be 416,000 mt and aquaculture annual production is 14,000 mt. These new estimates are unlikely to change the findings of this study, although, they are at the higher end of the projections used.
An FAO (2004) report predicts that aquaculture in sub-Saharan Africa will grow by between 6 to 8.1 per cent from 1997 to 2020. According to this estimate, aquaculture production in Uganda will only reach a level between 36,871.5 mt and 46,715 mt per year by 2017. When adjusted to the estimates released by the Uganda Bureau of Statistics (UBOS) in 2004, Uganda’s population is likely to rise to 38.92 million people in 2017, from a base of 25.2 million people in 2004 at a growth rate of 3.4 per cent. Even under the ostrich scenario, therefore, the actual fish demand is expected to be 449,200 mt. With total available production reaching only 366,871.5 to 376,715 mt per year, there will be shortfall in production of as much as 72,485 mt to 82,328.5 mt per year (see Table 3).

Under the ostrich scenario, the supply gap noted above will lead to higher prices for fish as less and less fish is available for consumers. Fish is a principal source of animal protein for many rural poor and over 17 million Ugandans. As a result of higher fish prices, consumers will switch to beef or crop-based proteins that are cheaper. This trend is already observed in Uganda, with fish prices surpassing the average price of beef per kilogramme. At the fish landing sites fishers sell 1 kg of Nile perch at Ushs 2,800 to Ushs 3,500 per kg (US$1.56 to US$1.94) and yet in the urban centres the price of beef is Ushs 2,500 per kg (US$1.39). However the inelastic beef market will not be able to supply enough beef quickly enough to meet rising demand and therefore price of beef will rise. Consequently, poor people will switch to the cheaper protein-based field crops. But these legume and cereal crops are also in high demand, as commodities such as beans, maize, groundnuts, sesame and peas are fast becoming important non-traditional agricultural exports, especially in the regional markets. The prices in the regional markets are higher, and with the growing preference for selling in the regional markets, domestic consumers have to pay a higher price. In addition, more farmers are leaving their fields for urban areas and crop production itself is stagnating in the short run. In the long run, however, production of beef and crop-based proteins will rise as producers compete for the producer surpluses that will have emerged in the market and perhaps eventually match market demand.

Table 3: Projected and most likely fish production and consumption statistics of the ostrich fish scenario

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Domestic per capita consumption (kg)</td>
<td>7.7</td>
<td>10</td>
<td>7.7</td>
</tr>
<tr>
<td>Aquaculture production (mt)</td>
<td>2,360</td>
<td>100,000</td>
<td>36,817.5 - 46,715</td>
</tr>
<tr>
<td>Total recorded production by volume (mt)</td>
<td>222,600</td>
<td>Not stated</td>
<td>366,871.5 - 376,715</td>
</tr>
<tr>
<td>Exports (mt)</td>
<td>30,000</td>
<td>30,000</td>
<td>&gt; 30,000</td>
</tr>
<tr>
<td>Maximum sustainable yield (mt)</td>
<td>300,000</td>
<td>330,000</td>
<td>&gt; 300,000</td>
</tr>
<tr>
<td>Illegal unreported unregulated exports (mt)</td>
<td>60,000</td>
<td>0</td>
<td>60,000</td>
</tr>
</tbody>
</table>


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14 Based on a study by the International Food Policy Research Centre and the World Fish Centre (Delgado et al., 2003).
15 Ugandan shillings.
3.4.3 Flying fish scenario

In the flying fish scenario, Uganda will aim to increase fish consumption to at least 15.6 kg per capita in line with the international average (FAO, 2004). With the population growing to 38.92 million in 2017, total domestic fish demand will be 607,152 mt per year, as shown in Table 4. The new Uganda Fisheries Authority (UFA) can then increase the export quota for fish to about 90,000 mt per year from 60,000 mt per year considered in the ostrich scenario.\(^{16}\) The total production required will then be 697,152 mt per year. In actuality, aquaculture could grow to 46,715 mt per year (at 8.1 per cent growth rate between 2006 and 2017). It is estimated (Nyeko, 2005) that if proper stock enhancement, restocking, rehabilitation and adequate management of the fisheries have been done by 2017, Uganda could reach an MSY of 500,000 mt per year (see Table 4). Therefore, substantive production will only reach 546,715 mt per year. Having excluded the 90,000 mt per year of the fish meant for export, per capita fish consumption could increase to 11.7 kg. Since slightly more fish would be available than under the ostrich scenario, the price of fish will also be more stable. Supply and demand for fish substitutes such as beef and crop-based proteins will be relatively stable, too. Indeed, although this is unlikely as fish accounts for just 4 per cent of the total protein intake with beef at 35 per cent (Delgado and Courbis, 1997), there may be efforts to try to win part of the fish market by lowering beef prices.

Table 4: Projected and most likely fish production and consumption statistics in the flying fish scenario

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic per capita consumption (kg)</td>
<td>7.7</td>
<td>15.6</td>
<td>11.7</td>
</tr>
<tr>
<td>Aquaculture production (mt)</td>
<td>2,360</td>
<td>100,000</td>
<td>46,715</td>
</tr>
<tr>
<td>Total recorded production by volume (mt)</td>
<td>222,360</td>
<td>607,152</td>
<td>546,715</td>
</tr>
<tr>
<td>Exports (mt)</td>
<td>30,000</td>
<td>90,000</td>
<td>90,000</td>
</tr>
<tr>
<td>Maximum sustainable yield (mt)</td>
<td>330,000</td>
<td>&gt; 500,000</td>
<td>500,000</td>
</tr>
<tr>
<td>Illegal unreported unregulated exports (mt)</td>
<td>60,000</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>


\(^{16}\) To cater for the 60,000 mt per year which is reportedly sold in the regional market but is not fully accounted for plus the current exports, which are approximately 30,000 mt per year.
3.5 Environmental impacts

3.5.1 Slumber fish scenario

The growth in international demand for fish has led to the expansion of processing and exporting firms serving the European market. Unfortunately, when demand increased, the fish firms realized that they had to spend a lot of money on buying fish, because the high and inefficient effort had depleted the stock and catches had fallen per unit effort (Odada et al., 2004). Over time, other problems such as salmonella and the use of poison capsized the less competitive firms in Uganda. The slumber fish scenario is based on the nine fish processors who remain in business and the number is envisaged to remain constant for the 12 years of the projection.

Three sets of environmental problems characterize the slumber scenario: (1) over-exploitation; (2) destructive fishing practices; and (3) pollution (specifically microbial, eutrophication and chemical pollution). In this scenario, motorised fishing is expected to stay at 20 per cent of the sector, with most fishers (80 per cent) being traditional and artisanal fishers. The pressure on the fishery in 2004 was lower, because given the 190,000 mt available for the domestic market and a population of 25.2 million, the national per capita consumption would be about 7.7 kg per capita relative to the established per capita fish consumption level, which ranged between 7 to 10 kg. (Nyeko, 2005). As the population grows to 38.92 million people (in 2017), the flow of fish to the regional and international markets will stagnate, as shown in Table 2 above. This already exceeds the maximum sustainable yield in 2004 of 330,000 mt. Overfishing will then evolve into using illegal fishing nets as the mature fish disappear and the younger ones are targeted. Odada et al. (2004) reported that as many as 50 per cent of the nets used in Uganda were illegal and could grow to 70 per cent by 2017. In a desperate move, some fishers may be willing to use blasting and poison. The fish stock will collapse, fish catches will drop considerably to below the 280,000 mt recorded in 2004, and the damage to the ecosystem will increase as more fishers try to tap a dwindling fish resource. These problems will be aggravated by inadequate funding for the management of fisheries (Keizire, 2003) resulting in pollution of water systems, sedimentation from farming, deforestation and other activities and high concentrations of chemicals and eutrophication.

3.5.2 Ostrich fish scenario

In the ostrich fish scenario, co-management as a form of property rights is proposed. The co-management under Beach Management Units (BMUs) and Lake Management Organizations (LMOs) empowers communities to manage the resources sustainably. The fishing communities organized in BMUs will be trained on how to sustainably manage the fisheries resource. It is expected that armed with this information, BMUs will lead to considerable reductions in sedimentation, dumping of household waste into the water system and use of illegal fishing gear (nets and/or poison). Other incentives under the ostrich scenario are:

- Training on diversification of income
- Encouragement of aquaculture
- Provision of market information
- Charge resource rents for use of the fishery.

It is expected that these incentives will lead to a reduced reliance on the capture fisheries and diversification into other activities including aquaculture. Some of the resource rent charges will be used in monitoring, control and surveillance (MCS) of the fishery.
Under the ostrich fish scenario, total fish production is likely to range between 366,871.5 mt and 376,658 mt per year by 2017. As observed in the slumber fish scenario, the current level of consumption both in the international and regional markets are envisaged to remain constant at approximately 90,000 mt (based on Uganda’s fish export volumes for 2004/05, and the recognition and legitimization of statistics on the actual volume of regional fish trade). However, to increase fish consumption to 10 kg per capita, fish production will have to increase to 479,200 mt. If the policy is pursued, then fishers would have to catch more fish from the capture fisheries. The FAO (2004), while recognizing the importance of co-management schemes, notes that the pressure to support members of the community to satisfy demand may encourage the communities to exploit beyond sustainable levels. The BMUs may improve the sustainable management of the fisheries resource but may be unable to entirely control over-fishing, especially when the demand is unmet.

Pollution will most likely decline under the ostrich scenario, however, and violation of the norms will continue because, as Odada et al. (2004) observed, the majority of the factories in Uganda have no waste treatment technology and there are no severe penalties for such behaviour. Although, pollution permits are used, these are not coordinated between the levying authorities (Ministry of Water, Lands and Environment, MWLE and the DFR). The greatest danger here lies in the chemical pollutants with high concentrations of toxic elements such as mercury (Hg), cadmium (Cd) and lead (Hg) which are not biodegradable. The Fisheries Policy (2004) supports the enforcement of pollution guidelines and proposes the use of economic instruments. However, the position on following up polluters is not articulated. In the medium term the high concentrations of these chemicals will threaten the minimum residue level (MRL) acceptable for fish and this will lead to the exclusion of Uganda’s fish exports from the international markets. The fish will also be banned in the domestic market if the MRL is breached. From an environmental perspective the greatest danger is that the chemicals could target breeding sites and kill spawning and younger fishes, having a detrimental effect on the fishery. If the control regime is not strict as could be the case under the slumber fish and ostrich fish scenarios where rent-seeking violators manipulate regulations and standards as long as it saves them the extra cost of waste management, then the government has to pick up the bill for the clean-up. The ostrich scenario hopes that the regulations and fines will be sufficient but this is unlikely and it is inevitable that the dangers described above will remain.

In another project, UNEP in collaboration with Economic Policy Research Centre (EPRC) and NEMA supported DFR to implement the use of economic instruments for sound and sustainable management of fisheries in Uganda. In a series of stakeholder consultations and discussions, a number of policy response packages were recommended for implementation in support of sustainable exploitation of fisheries resources in Uganda. From the results of the initial studies, NEMA, EPRC and DFR agreed to implement a pollution tax on industries polluting into the Ugandan Lakes. This was aimed at eliminating and/or reducing the risk of contaminating fish, and safeguard fish safety and quality for export as required by other nations.

In a process of implementing this pollution tax instrument, stakeholders came together to consider the implementation modalities. The stakeholders made the following resolutions:

- The effluent charge instrument should be implemented in other countries that share water bodies with Uganda, such as Kenya, Tanzania and Democratic Republic of Congo.

17 Delgado et al. (2003) projected between 1997 and 2020 that there will be a 0% growth in per capita fish consumption in Europe, which is Uganda’s major export market. The growth in per capita consumption in sub-Saharan Africa is expected to remain at 0% as well but volume growth may result from population growth in sub-Saharan Africa. Therefore, a further assumption in the scenarios developed above is that the regional demand growth cancels out the falling demand from Europe due to Europe’s falling population.
• The Ugandan DFR should coordinate pollution charges on offenders with the relevant committees of the East African Community, perhaps through a new council.
• In the absence of clear information whether Kenyan and/or Tanzanian industries currently pollute, and have instituted mechanisms to regulate this pollution, an appraisal is necessary to evaluate the current status of pollution control in these countries. The standard of pollution control can guide the Council of Ministers for Lake Victoria Fisheries Organization (LVFO) to make appropriate decisions for all the countries.

According to Nyeko (2005), discards were found buried under ground in the Kalangala Islands of Uganda, and recently, a flourishing market of feed manufacture has been taking place between the Islands and Kampala. In the slumber scenario, discards are considered a marginal loss to the fishery and no strict measures are in place to control them. Under the ostrich scenario, the policy will follow the codes of conduct proposed by the FAO (2004). In essence this requires a no-discards policy and fishermen are urged to use the best available fish net technology to ensure that as few non-target fish species as possible are harvested. The problem with this is that it will have to be imposed on a co-managed fishery dominated by artisanal fishers, whereas the ostrich fish scenario hopes to encourage this through educating BMUs and LMOs to convince their members about this technology. The cost may be relatively high and the poor fishers who should be empowered by the policy may get left out. Therefore the technology itself should be affordable. The other danger is that the by-catch actually has a market that encourages illegal exports of fish especially to the Democratic Republic of Congo, but the local feed industry is also a clear danger. Essentially, as the FAO notes, there is a need to study the trade-off using ecosystem-based approaches between using by-catch and the amount of discards.

In the ostrich scenario aquaculture will grow from a humble 2,036 mt per year to potentially 36,872-46,658 mt. The implications here are that as aquaculture grows, there is a need to face up to the potential environmental problems such as abandonment of ponds and land degradation; deforestation; pollution of wetlands; rivers and lakes; use of products from capture fisheries to feed omnivorous and carnivorous commercial aquaculture fish types; and the potential escape of fish from the cages into the wild fisheries which may threaten wild breeding grounds through competition, predation and interbreeding with other fish in the water bodies especially those already facing extinction such as the cichlids. In the ostrich scenario, the aquaculture projects will be assessed using EIA and MCS to develop appropriate measures to counter the potential environmental threats, and aquaculture guidelines developed for cage farming and other commercial fish farming ventures that are likely to be developed in future. However, the reliance on standards and the absence of charges leave the fisheries regulators with a huge cost in case of an environmental disaster.

### 3.5.3 Flying fish scenario

In addition to the incentives under the ostrich fish scenario, the flying fish scenario encourages the use of payments/compensation for ecosystem services (PES) as a way of promoting sustainable fisheries management. The direct incentives from PES will be for sustainable fishing yields to get access to an already growing market. Assistance will be focused on eco-labelling and certification through the increased activity of Development Partners (DPs) and use of resource rent charges.

In addition to enforcing standards on pollution and developing guidelines for aquaculture, and using EIAs to approve aquaculture projects, the flying fish scenario will pursue the use of economic instruments, or

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18In Uganda the Export of Organic Products Programme (EPOPA) funded by SIDA (Swedish International Development Agency) is already assisting farmers to export sustainable fish through a local fish exporter Greenfields Uganda Ltd. to the European Union.
specifically pollution charges for chemical substances, eutrophication and other effluents released that directly threaten the fish industry. The threats come through MRL, BOD and poisonous substances. The violators targeted will be expected to pay for the clean-up of their effluents. This addition to the policy will be harmonized with the other institutions that are responsible for water management (NEMA and the Directorate for Water Development, MWLE/Wetland Inspection Division). However, punitive charges will also be employed in aquaculture to prevent behaviour that threatens the capture fishery; forest trees, vegetation and arable land; and also govern the activities of other aquaculturalists such as waste disposal and type and quantity of feed used in cage fish farming.

Under the flying fish scenario the Uganda Fisheries Authority (UFA) will be managing the fisheries which will in turn be managed by the Boards of dams, rivers, and channels. Stock enhancement and restocking will be carried out for depleted fisheries to ensure that all fisheries are utilized. After carrying out cost-benefit analyses, water bodies and systems that formerly were part of the national fishery will be rehabilitated, and some wetlands that are not endangered will also be used as additional habitats for the fisheries. Nyeko (2005) estimates that MSY may increase from the 2004 estimates of 330,000 mt to over 500,000 mt. For the sake of this analysis 500,000 mt of MSY will be projected for 2017.

Because the fisheries are expected to be fully utilized, there will be a trade-off between maintaining the fisheries biodiversity as well as other components of the ecosystem, to ensure its resilience and increased productivity from fully exploiting the fishery. In theory the ecosystem approach should be able to achieve resilience by ensuring sustainability for the ecosystem as a whole rather than the sustainability of fisheries alone. However, in practice stock enhancement, restocking, additional habitats and rehabilitation of habitats if poorly done could on their own endanger the very ecosystem they intend to make more efficient. Therefore the sustainability question here is whether the final decision on the trade-off, perhaps through the environmental cost benefit analysis (ECBA), ensures sustainability of the ecosystem. To tilt the trade-off towards sustainability, the scenario also proposes organic and sustainable fish farming, and eco-tourism ventures especially on those unique fisheries like in the Kazinga channel and Sango bay area, where the biodiversity of both birds, fish and other flora and fauna may offer greater benefit to the fishing communities than commercial fisheries.

### 3.6 Effects on social equity and poverty reduction

#### 3.6.1 Slumber fish scenario

Under the over-exploitation regime of the slumber fish scenario, fish stocks will start depleting and fish catch will be lower. There will be high levels of pollution brought on by eutrophication and proliferation of the water hyacinth. Chemical poisons will kill fish especially in breeding grounds. As a consequence per capita fish consumption will decline as reduced catch is spread over an increasing population. If fish catches remain at about 280,000 mt per year, per capita consumption will fall to approximately 5 kg. Similarly, because fewer fishers will have access to the fishery, there will be more incidences of malnutrition even among fishing communities, particularly among communities that rely on fish as the principle source of protein. The livelihoods of the 1.2 million people who live off the fisheries subsector will be negatively affected.

As the stakes increase in a diminishing fishery, vulnerable groups like the poor and women will be heard less and the access rights of women, which are already very low (6 per cent) will fall even further. These

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19 Nile Perch and Nile Tilapia are more susceptible to low oxygen conditions. These fishes are absent in areas that tend to have anoxic conditions.
vulnerable groups will continue to have limited access to the fishery and women will continue to depend on their fisher husbands (and relatives) to sustain their livelihoods. By being unable to own motorized boats (only 20 per cent of the boats used were motorized, according to Keizire 2003) they will continue to harvest less fish. Children and women of a child-bearing age will bear the brunt of the reduced nutrition as less and less fish is available.

In the short run, the fisher population who rely on artisanal fishing practices (over 80 per cent) will be most affected, because as fish stocks diminish more and more effort will be required to catch fish. In addition to this, the tender system will move to protect those who can afford to pay the landing site fees and those who can pay bribes, further exacerbating the inefficient effort of the poor fishers. In the long run, all fishers will be surviving on a depleting resource and even the fishers with motorized boats will have to go out more frequently and harvest over a wider area. Eventually, they too will find it too expensive and ground their fleet.

The slumber fish scenario also threatens fish processors and exporters and their employees as well as NGOs and government Fisheries Department staff because the sustainability of their work depends on having a sustainable, or perhaps growing, supply of fish coming from both capture fisheries and aquaculture. The number of workers employed may decline in proportion with the decline in the productivity of the fisheries.

The slumber fish scenario could jeopardize the livelihoods of the 1.2 million people, increasing to 1.8 million by 2017, who rely on the fisheries sector for their livelihood. In 2006 about 300,000 are likely to be fishers and 90,000 employed at government, private or civil society level. Another 810,000 people who live in the fishing communities are net makers, boat manufacturers, fishmongers and the families of fish subsector employees. The 17 million regular fish consumers in 2004 will grow to approximately 26.4 million people by 2017. This dire scenario leads to intensified social conflicts. For example, one particular problem is the theft of boat engines and fishing gear, which has led to considerable disenfranchisement, although the situation is now improving as government, police, BMUs, local government and other stakeholders have stepped upfront to protect private properties.

In the short-term, the rich fishers may benefit from the market failures such as bribery in tender allocation, but when fish stocks collapse they too will lose their revenue. Fish processors and exporters will also lose their investments in the fisheries industry. A start-up in fish processing for export requires at least US$2 million (UIA, 2004) in addition to the other investments in building capacity and relationships with fish suppliers and in the importer countries.

3.6.2 Ostrich fish scenario

In 2003, 69 per cent of the population were reported to rely on fish as an important source of protein (Bahiigwa and Keizire, 2003). Under the ostrich fish scenario, there is a possibility of not only increasing this proportion of people, but also increasing the quantity of fish they eat. Per capita fish consumption will improve from 7.7 kg but will still be less than 10 kg.

In the ostrich scenario, there will be fewer fishermen operating in a better managed fishery. However, some of the environmental problems observed in the slumber fish scenario will arise again if the regulators are unable to limit fishers who have access to the lakes or rivers; prevent polluting activities due to the rent seeking behaviour of violators; and accumulate enough instruments to deal with destructive behaviour or to reward and encourage good behaviour. One problem of fish smuggling is presented in Box 5.
Fishermen, in the Lake Victoria region, are five times more likely to die of AIDS-related illness than farmers. HIV prevalence rates in the lake-side towns and villages in Kenya, Tanzania and Uganda are thought to have reached levels as high as 30 - 70 per cent during the late 1990s (FAO, 2002). Twenty four per cent of fish folk on Lake Albert, Uganda were HIV positive in 1992, compared to 4 per cent in agricultural villages. Sustainable fisheries become important because proper nutrition with protein and micro-nutrients (minerals) is essential for the effective use of drugs. In addition, increased income enables the infected to obtain better health services. Both the ostrich and flying fish scenarios therefore, will have positive effect on HIV/AIDS. Such effect may be reinforced with a government initiative, such as the one documented in the provisional Fisheries Sector Strategic Plan, which includes treatment and care for people infected with HIV/AIDS in the mainstream National Fisheries Policy.

With an expanding fishery under both the ostrich and flying fish scenarios opportunities for employment will be growing. New jobs will be found directly in the fishing industry including fishing, processing, and aquaculture production, and indirectly in industries that serve the fishing industry such as net making, marketing, advertising and branding of fish and fish products, and advocacy groups. The ostrich and flying fish scenarios will also increase the benefits for indigenous fishing communities by advocating increased co-management throughout Uganda’s fisheries. From a cultural perspective, fish is a totem-pole and clan symbol for some tribes in Uganda. When local fishers participate in co-management of fisheries, which also have cultural importance, they gain added value from having participated in the preservation of their cultural heritage.

Adherence to sanitary and phytosanitary standards from the fishing community level up to exporter level benefits the consumer and also avoids preventable environmental health problems such as malaria, cholera, and dysentery. Such a system provides adequate traceability that can easily be assessed for compliance with international requirements. But the suggestions to use DDT21 and reduce overcrowded fishing communities to control the health problems, though very likely to be adopted, are highly controversial to say the least. In particular, the application of DDT may threaten Uganda’s access to the international market.

Under both the ostrich and flying fish scenarios, at least 30 per cent of access to the fisheries will go to women, and the resources will be managed by the BMUs to ensure equity for all members, rich or poor. The motorized boat owners will still do better than the artisanal canoe, but this gap will be much diminished. In fact the rich fishers’ tendency to monopolize the fishery and landing sites will be replaced by a democratic arrangement of fishing rights. As fish stocks recover, there will be more fish caught. However, the greatest

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20 Many of the fishermen are migrants.
21 dichloro-diphenyl-trichloroethane.

**Box 5: A case of smuggled fish: illegal exports to the Democratic Republic of Congo**

Inadequate enforcement along with poorly constructed economic incentives was cited in the case of illegal exports of fish to the Democratic Republic of Congo (DRC). When trucks full of fish destined for the market in the DRC are apprehended, their goods are confiscated and violators are charged in court and fined Ushs 40,000 per lorry. Yet each lorry load could be worth over Ushs 5,000,000. These fines are similar to those that existed before the policy. The size of the fine is unlikely to effectively discourage violators who may look at the policy as a status quo declaration and continue as before.

*Source: Boaz Keizire - Senior Economist, DFR (personal communication)*
opportunity will be in aquaculture, and fishers who are unable to switch from capture fisheries will lose out.

Aquaculture, however, poses significant dangers to the environment, although neither the ostrich nor the flying fish scenarios envisage failure. If failure does occur, then the same threats to the fishery as described under the slumber fish scenario will take place, including loss of income due to breach of MRLs, high BOD that leads to a decline of commercial fish stock, sedimentation and eutrophication (which reduces oxygen content of water and therefore leads to suffocation of fish).

Commercial aquaculture proposed under the ostrich and flying fish scenarios may also threaten the survival of small-scale fish processors in view of the efficiency, technology, and capital investment required. They already face competition from capture fisheries with large processors and exporters who can pay high prices. There is scanty information about just how many small-scale fish processors will be threatened but the great majority are women.

For a long time, trade in illegally harvested immature fish and/or smuggling fish from Uganda to Kenya, DRC, Rwanda and southern Sudan went on unabated. This is largely due to inadequate and ineffective enforcement of regulations and MCS compounded by bribery. The ostrich and flying fish scenarios propose accountability for all fish harvested and sold through a more comprehensive database that leaves record keeping to BMUs themselves. Many fishmongers, fishers and local government officials will lose out on extra illegal earnings made.

In the ostrich fish scenario, the fishermen who are displaced from the fishery will lose their industry access. The old groups of private tender holders - rich fishers who economically dominate the fishery will lose their favourable access to fishery as the management changes from individual tender bidding to co-management through BMUs. Motorized boats will be limited to certain fishing areas to ensure that even the poor fishers will have equal access to good fishing. Commentators believe that ultimately the strong within the community will still dominate, but this time they will do it in cooperation and with legitimacy from the new Fisheries Act through the BMUs. The successes of the new structure will depend on continually evaluating how the poor and vulnerable are engaged.

### 3.6.3 Flying fish scenario

In the flying fish scenario, fish consumption will increase from 7.7 kg per capita to at least 11.6 kg per capita. This level of nutrition will ensure that the population will be healthier, with women of child-bearing age and children standing to gain most from consuming increased fish nutrients such as fatty acids, proteins, and minerals. Better nutrition reduces child mortality, improves neural development of the foetus and lowers the risk of low birth weight, all key factors in child mortality.

Under the flying fish scenario, there will be less pressure on capture fisheries from pollution and large numbers of fishers because alternative enterprises will exist. New income sources from organic aquaculture and sustainable fish products will ensure premium prices for specialized groups of fishers as well as stock enhancement and restocking, rehabilitation of fisheries and more income revenues.

The improved access and incomes from the fishery will further increase the nutritional status. The income gained will enable women to have more power within the community. They will have money to send their children to school and provide healthcare for themselves and their children. The health and wealth of communities will improve enabling people to spend a larger proportion of their income on healthcare. The Fisheries Policy under the ostrich fish and enhanced under the flying fish scenario does not discuss the
number of fishers that will be displaced to ensure sustainable effort, largely because an accurate inventory of all fisheries is still needed. It is widely believed, however, that the current population of fishers, at approximately 135,000, is more than adequate and future increases will be restricted. The fishers who are displaced will lose access to free food (in fish) as well as fishing income.

In the flying fish scenario, there is a strong possibility that capitalist investors will squeeze out small processors and aquaculturalists due to their higher productivity, efficiency, ability to comply with the new aquaculture regulations, and investments in seed fish, processing and marketing. To address the concerns of these potential losers, the National Fisheries Policy proposes training for BMUs on how to collect data and administer the fisheries sustainably. In addition, the DFR, together with the National Agricultural Advisory Services (NAADS), is carrying out training on diversification of income among fishing communities. There has also been training on use of microfinance to start up a small business and education on how to win greater access to resources, especially for women.

There are on-going activities to upgrade landing sites. Current activities include the modernization of 11 landing sites countrywide. The government is also bolstering its MCS capacity by acquiring boats to monitor fishing and smuggling across the lakes, especially Lake Victoria. The government, DFR and Revenue Monitoring and Smuggling enforcement officials are working together to cut down on the number of illegal fish exports though increased surveillance and confiscation. There is a programme in place now of confiscation and burning of all illegal gear, especially illegal fish nets. In developing fisheries policies and guidelines such as for aquaculture, the DFR has committed itself to wide consultation with stakeholders to ensure ownership of these policies and guidelines, thereby reducing the cost of their enforcement.

3.7 Economic and trade implications

3.7.1 Slumber fish scenario

In the slumber fish scenario, the effects of poverty on economic and trade performance are that large numbers of artisanal fishers will have to survive on a shrinking fishery. To get around the problem of lower efficiency, artisanal fishers may use illegal fishing nets. Where fish cannot match international market standards, fishers will seek to expand regional markets through illegal unreported exports. Illegal exports represent a loss of revenue to the country, curtailing the ability of the authorities to manage the fisheries. Processors and exporters also grow desperate as fish catches decline. Bahiigwa and Keizire (2003) reported a decline in operational fish factories in Uganda from 11 to 9 due to reduction in fish catches and the fish ban of 1999. In the long run, further shocks to the fishery will encourage further exit of fish processors and exporters.

The government of Uganda provides some education and healthcare to fishing communities, but the communities also privately pay a considerable percentage of their health and education bill. Should their incomes fail further, the government will have to step in and pay for the extra healthcare and education, which diverts valuable national resources from other equally important priorities such as infrastructure development (roads and electricity), especially in regions of the country that have in the past been marginalized.

In spite of the efforts the NEMA and DFR, there is still a lot of farming that takes place along the shoreline of water bodies. This leads to sedimentation and nutrient enrichment especially along heavily populated shores. Two solutions have been proposed: regular dredging of the algae, and resettling communities. Dredging has been used to clean up the water hyacinth. However, communities continue to farm along the shores and

22 A natural insect enemy was also used to control the water hyacinth in Lake Victoria.
their tenure over fisheries resources is protected under the National Fisheries Policy (2004), constituting perverse incentive.

The greatest dangers to trade and the economy, however, are the continued threat of a salmonella outbreak, breach of the MRL or just the break down in the sanitary and phytosanitary standards of the fish, threatening Uganda’s access to the international market. The *ostrich fish* and the *flying fish* scenarios place considerable emphasis on ensuring that standards are kept.

**Box 6: A history of EU bans on fish exports from Uganda**

From 1996 to 2000, the European Union imposed three export bans on fish from Uganda for a number of reasons. In 1997, Spain and Italy rejected importing fish originating from Uganda because they detected salmonella in the imported products. This ban reduced the quantity of fish that was exported but did not seriously affect the overall quantity as most of the EU continued to accept fish imports from Uganda.

In December 1997, the EU imposed a partial ban, stopping the export of fresh-chilled fish products from Uganda following an outbreak of cholera on some landing sites on Lake Victoria. This ban was very significant in as 95 per cent of the fish exported to EU were chilled fresh fish. Early in 1998, after suspected incidences of fish poisoning were reported in Uganda on Lake Victoria, the Uganda Government imposed a temporary ban on fish exports. The EU followed by imposing a ban on imports of fish originating from Lake Victoria. The decision affected not only Uganda but also Kenya and Tanzania.

The EU inspectors carried out an assessment of Uganda’s fish subsector and identified that the structure of the competent authority (the DFR) was problematic. There was lack of a clear line of command between the Ugandan National Bureau of Standards (UNBS) and fish inspection services under the DFR of the Ministry of Agriculture, Animal Industry and Fisheries; there were no existing suitable laboratory facilities for pesticide residue analysis; the existing legislation, the Fish Act (1964), had not been updated to meet EU quality, safety and hygiene requirements; the fisheries officers within the decentralized units were not effectively answerable to DFR and hence were not following the instructions regarding hygiene and handling of fish as required by EU regulations; most landing sites were not upgraded and did not meet minimum EU requirements and in general, fish was unhygienically handled throughout the chain.

In response, the Uganda Government put in an effort to streamline the fish inspection services and the capacity of the DFR through training of inspectors, provision of equipment and introduction of fish inspection manual. In response to the EU requirements, technical support to other institutions was also provided especially in Good Hygiene Practices (GHP) and Hazard Analysis and Critical Control Point (HACCP) to specialists from the private sector, DFR, Uganda National Bureau of Standards (UNBS), Makerere University and the Industrial Research Institute. Uganda was supported to develop a Microbiology Laboratory at the UNBS, fully equipped and with an introduction of a Quality Management System. Chemiphar (Uganda), a privately owned laboratory was approved by the EU inspectors for pesticide residue analysis, a function that it still does to-date. The Government is also developing and upgrading the Chemist Analytical Laboratory.

*Source: Keizire (2004)*
Small-scale processors survive through buying fish at lower prices, as competition with large processors increases. When the effects of stock depletion are felt and become expensive, the small-scale processors will close or consolidate through vertical or horizontal integration. This has positive effects if it leads to greater efficiency, but other consequences such as loss of jobs may be inevitable. Close to 390,000 people were reportedly employed in the fisheries sector, out of which 300,000 were fishers and about 90,000 with government, NGOs and others such as fish processing workers, fishnet makers and boat manufacturers. These people will have to be absorbed into the economy somehow, as 1.2 million people survive on their income.

The fisheries subsector is one of a few that generates surplus for the Ugandan economy. In 1999 when the EU banned Ugandan fish exports, over 80 per cent of the revenue was lost. There was a considerable investment on the part of the Government to upgrade the quality management system and convince the EU that the appropriate action had been taken. A similar sanction in future could lead to a similar or even greater expenditure. This in itself would be a strain on resources meant for other sectors.

Box 7: Low fish prices: Good or bad?

Debate on whether a low price of fish in Uganda is good for the fish subsector was one of the topics discussed at the National Consultative Workshop on the Integrated Assessment of the National Fisheries Policy held on 8 November 2005. Two schools of thought emerged. The first one was in line with the international consensus that fish is a source of animal protein for the poor. The other view, proposed by Uganda’s Commissioner for Fisheries (Mr. Dick Nyeko), was that there has been considerable progress in the fisheries subsector. Fishers who earned Ushs 700 per kg (or US$0.39) just a few years ago today earn Ushs 2,800 per kg (US$1.56). The price has led to a better organized fish market value chain where higher revenues are received by the poor fishers. The sector is envisaged to develop further if the prices of fish are good. Low prices will only dampen this development. In fact, the current market estimates show that Ushs 2,800 or US$1.50 per kg of Nile Perch is slightly more expensive than the Ushs 2,500 or US$1.35 per kg of beef. Therefore rather than purposely seeking to lower the price of fish, the ostrich and flying fish scenarios suggest increased production of fish. Already, Nile Perch forms over 90 per cent of exports (MAAIF, 2003), followed by Nile Tilapia, which is also the most common fish in the domestic market. Mukene is also sold domestically, although a large amount is reportedly smuggled into neighbouring countries. Ultimately, it is a question of trade-off. With a head count poverty standing at 38 per cent, there are many fish consumers who cannot afford a higher price of fish. It is better that the poor have access to a cheap source of fish. However, because the capture fisheries are unlikely to expand to meet this demand, the expansion of aquaculture is the most likely solution.

Source: IAP Fisheries Policy Workshop (2005)

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3.7.2 Ostrich fish scenario

As proposed in the National Fisheries Policy and the Provisional Fisheries Sector Strategic Plan, there will be a need to provide micro-finance to small-scale fish processors and aquaculture start-ups, especially the groups that are already vulnerable such as women. There is also a need to train and retool fishers so that they can move into the non-fish sectors and diversify their incomes so that they are not solely dependent on capture fisheries. It is also hoped that the BMUs will be good institutions to start with to encourage fishers to look beyond just fisheries. The government also hopes that education and increasing the literacy rate and level of professional skills in fishing communities will enable them to search for opportunities elsewhere.

When fish catches decrease, desperate fishers will use illegal and smaller-sized nets, blasting or even poison to catch fish. This type of behaviour would be repeated if the policy failed to stand firm or be adhered to. Even when the policy is adhered to, collusion between members of the BMUs may prevent the displacement of excess fishers since they have family within the fishing community. They could just choose to stay and continue fishing.

In Uganda there have been occasions where communities have lost a fish landing site due to another economic activity such as the construction of the Bujagali dam. They have, through their members of Parliament, carried out demonstrations to express their displeasure. Such demonstrations may occur from groups that feel they have lost out under the new policy, including commercial processors and their workers if the policy means a less regular supply. The large commercial processors and exporters may scale down their activities to keep their profit margins. In doing so, they will reduce their waged and salaried employees and perhaps even cut back on the quantity and price of fish.

Although foreign and domestic investors have expressed interest to invest in both aquaculture and capture fisheries, threats such as fish diseases, depleting stocks and poor environmental management will keep these investors away. Such investment usually would have multiplier effects throughout the economy.

3.7.3 Flying fish scenario

In theory, both vertical and horizontal integration proposed under the ostrich fish scenario offer small-scale fishers an opportunity to be more competitive. In practice, however, small-scale processors serve specialized niche markets of fried, smoked and sun-dried fish, especially in the domestic market. At the same time these small domestic markets are composed of poorer consumers who are very price sensitive, and cannot afford added costs of either vertical or horizontal integration such as transportation and administrative costs. In some cases horizontal and vertical integration may be useful, and for specialized small-scale processors, micro-finance, training, provision of market information and improvement of local infrastructure would be more appropriate under the flying fish scenario. Infrastructure improvement includes cold storage systems, landing site facilities, and cheap energy equipment.

Small-scale processors whose survival is threatened if stocks deplete and catches decline will have the option of aquaculture. While the small fishing communities, encouraged under the ostrich fish scenario, will still be the largest section of fishers, smaller more targeted aquaculture will emerge in the flying fish scenario, largely in response to market demand and as part of a deliberate plan by government to ease the pressure on capture fisheries. Scattered aquaculture projects comprised of small groups, typically women’s associations who own fish farms and sell to subsistence fishmongers, exist under the ostrich scenario. However, under

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24 Where a single organization takes control over added activities within the value chain such as merging purchasing, transportation and processing of fish.

25 Where a group of fishers or fish processors decide to combine their efforts to reduce costs.
the flying fish scenario these networks are expected to be dominant and compete to supply to fish processors, especially Tilapia and Nile perch.

One of the major tasks likely to preoccupy fisheries resource managers and policymakers under the flying fish scenario will be finding an effective market to supply. Progressive production in Uganda as in other parts of the world is determined by effective demand, where producers get a fair price that encourages additional production. Consistency in the market has been lacking in other subsectors such as the crop subsector since very little processing of the final product takes place. In fact, DFR is already looking at means of diversifying aquaculture (Nyeko, 2005) to suit international market demand. Together with FIRRI, DFR is experimenting with exotic fish species that are particularly attractive for Western markets.

**Summary**

From the analysis carried out, it is clear that implementation of Uganda’s Fisheries Policy outlined in this study under the ostrich fish scenario will be a significant improvement on the pre-Policy situation described under the slumber fish scenario. However, a number of possible constraints to successful implementation of the Policy have been identified by the assessment and an enhanced Fisheries Policy, as proposed under the flying fish scenario, will be the most appropriate option. The flying fish scenario proposes additional measures to encourage full implementation of the Policy as well as to address a number of gaps identified. These recommendations are outlined in the following chapter.
4. Recommendations and conclusions

The conclusions and recommendations from the preliminary assessment of the Draft National Trade Policy were presented in Chapter 2. This chapter presents the recommendations and conclusions from assessment of the 2004 National Fisheries Policy.

4.1 Recommendations for an enhanced Fisheries Policy

**Strengthen capacities:** Successful implementation of the National Fisheries Policy and the realization of the *flying fish* scenario will depend on building the capacities of the various levels of government. For the central government, capacity building will be required in the fields of integrated policymaking, policy implementation and monitoring, coordination among different sectors and local government. Local governments will need to be empowered to implement national policies, enact ordinances and by-laws, and mobilize communities. Local communities need to be enabled to participate effectively in policymaking processes, and propose appropriate and location-specific development plans. This will require the timely availability of adequate funding.

**Spend revenues wisely:** The DFR should, in consultation with the fishing communities, use the revenues on community projects that lead to human development. The Fisheries Policy has identified health and primary education as essential areas for investment. Although the running of public schools and health centres comes under the jurisdiction of different local governments, the Local Government Act (1997) allows local government to seek independent funding, which could be provided by the DFR. Furthermore, in the integrated lake management structure, the LMOs, which are newly empowered organizations to oversee the disbursement of funds, may be able to monitor the use of funds by local government and the BMUs. The use of independent auditors to complement government-level auditing of funds and activities has in the past been useful in ensuring that funds are used properly.

**Apply economic instruments**\(^{26}\): Economic instruments have the potential of both generating the resources needed for fisheries management as well providing the incentives to conduct fishing activities in a responsible manner. Several instruments that have been proposed previously are re-emphasized here: (1) mix of quality standards and differential pricing of fish to encourage the fitting of fishing boats with cold storage facilities; (2) partial privatization of landing sites and charging of a user fee to generate revenue for the installation and maintenance of improved facilities at landing sites; (3) a system of effluent discharge fees based on the Malaysian Effluent Charge System (see Box 8); (4) a transferable landing site-based fish quota system whereby officials based at different landing sites will supervise and allow fishing boats a maximum fish catch per year; (5) setting taxes at the processing and export levels to generate revenue for resource management

\(^{26}\) Based on Muramira (1999), who estimated the potential economic benefits of improving the management of Lake Victoria fishery (Ugandan side) at US$9.90 million and the associated management costs of about US$5.9 million, resulting in a net benefit of US$4.0 million.
and to induce possible relocation of excess capital in the sector to other productive sectors of the economy; (6) limiting licensing of new fish processing firms until the size of fish stocks is clearly known.

**Box 8: The Malaysian Effluent Standard-Charge System**

The Malaysian Effluent Standard-Charge System was instituted with the passage of the Malaysian Environmental Quality Act of 1974. It included provisions for using economic incentives and disincentives in the form of effluent charges in support of, rather than replace, regulations on discharges. The Act requires that all dischargers pay a fee to obtain a license to discharge waste into public water bodies. The fee varies according to one or more of the following factors: (1) the class of the premises; (2) the location of the premises; (3) the quantity of wastes discharged; and (4) the existing level of pollution. Experts have concluded that despite its effectiveness in controlling palm oil pollution, the system is not economically efficient. However, despite its weaknesses, the Malaysian mixed MBI-CAC system provides valuable lessons for developing countries that are planning to introduce market-based instruments to support environmental legislation.

*Source*: Benson and Muramira (1999)

**Box 9: Recommendations and lessons from the use of economic instruments in Uganda’s fisheries subsector**

(a) The National Environmental Management Authority (NEMA), had discussed the issue of pollution charging with a number of relevant stakeholders who including polluters, regulators and parties affected by pollution. The discussions generated an agreement that NEMA would delegate to institutions affected by the pollution using the provisions within the National Environment Act Cap 153 and instituting charges:

- DFR as a competent authority could levy a charge on pollution specifically to protect fish.
- The Ministry of Water Lands and Environment, under the Directorate of Water Development (DWD), has wastewater discharge permits, which do not cover all aspects of pollution. This needs to be evaluated critically to understand its implications.

(b) Some fish processing firms across Lake Victoria (such as Byansi and Greenfields) do not have access to the main sewage system but have sewage and effluent treatment points. The rest of the fish processing firms discharge their effluent into the main national Water and Sewage Corporation (NWSC) sewer and pay costs of sewage treatment accordingly to the NWSC. There are concerns that NWSC is the biggest polluter and efforts to strengthen its compliance need to be stepped up as the pollution charge is instituted.

(c) The concern that flower growers and exporters are potential big polluters was also discussed. Since the effect of chemical accumulation takes a relatively longer time to cause problems, instituting a pollution charge here will require separate treatment. This will require a study that can ascertain the amount of chemicals accumulated and the extent of damage it would create.

(d) There is a need to design a pollution instrument that cuts across different polluters group but are designed differently to cater for low or small polluters.

(e) The fisheries quality and safety inspection division under the Department of Fisheries Resources should start monitoring the level of pollution levels, as part of the project, to ascertain the level of compliance among industries or polluters at major effluent points.
Ensure benefits to the poor: Different groups of extremely poor people at the fishing community level should be identified for support. Investment should mainly focus on improving access to services without which the community would be worse off. These include access to health care, especially maternal healthcare, education and safe drinking water. Activities should also be organized for small discrete groups of women, youth and people living with disabilities (PWDs). These groups have been identified as most vulnerable to activities of rich fishers and to environmental health problems associated with the fisheries subsector. The package of assistance should be as comprehensive as possible.

Address the concerns of the losers: To help the poor fishers who may be disadvantaged by the Fisheries Policy, the long-term solutions lie in education so they do not have to rely on fishery as their only means of livelihood. For the richer fishers who may lose by surrendering their fishing rights to the communities, the policy could introduce incentives to invest in aquaculture, including redirecting some of the existing subsidies towards aquaculture and exploring export opportunities for farmed fish. Apart from these measures, it will be useful for the fisheries authorities to work with parliament to ensure that the voices of all stakeholders are taken on board as new policies are designed and implemented. It will be effective to introduce a pilot phase during which all stakeholders are educated about the implications of the new Fisheries Policy and some of them able to redress the potential loss of their rights.

Engage the private sector: The private sector includes fish processors, subsistence fishermen and commercial fishermen as the main groups and other smaller groups such as fishmongers. The small-scale subsistence fishers and commercial sector should be encouraged to use better fishing equipment that minimizes by-catch. It should also use environmentally sustainable harvest practices that are encouraged in the Fisheries Policy. The private sector should be engaged when developing economic instruments. At the same time, the capacity of the private sector should be improved so that they can appreciate the efficiency of using economic instruments. In case their activities lead to pollution, they should accept the penalty for the activities that damage the fisheries resource or carry out the cleaning up work themselves. The government and local communities should welcome the private sector to participate in monitoring the spending of the revenue generated from the fishing industry.

Strengthen environmental laws and regulations: Many laws relating to fisheries resources in Uganda are outdated, inadequate and scattered in many disparate bodies of legislation (Wabunoha, 1999 and Bahiigwa et al. 2003) A detailed study on the laws governing fisheries and other aquatic resources of Uganda should be carried out, with the aim of improving laws, making appropriate institutional changes and updating regulations. The National Fisheries Policy gave recognition to the abovementioned weaknesses in the laws and regulations and has advocated promulgation of a new principal law for effective fisheries management and utilisation and better institutional structure (MAAIF, 2004).
**Improve law enforcement:** Improving enforcement of fisheries laws and regulations will require the involvement of all stakeholders in the enforcement process. Enforcement officers should be endowed with more powers to stop and search vessels, inspect fish catch, gear and documents and arrest violators. Effective law enforcement mechanisms should be developed, including enhancing the ability of enforcement officers to prosecute. Transport facilities and financing should be made available to fisheries personnel to improve their ability to enforce laws. There is a need to strengthen the power of the law and the ability of regulators to level punitive charges that will reduce the possibility of future violation. This should particularly be applied to fish smugglers and fish factories that have failed to acquire waste treatment technology or those whose technology is inefficient.

**Develop guidelines for Environmental Impact Assessment for Aquaculture:** one of the mutually agreed upon positions at the stakeholder workshop for the fisheries IAP was the need to develop EIA guidelines for aquaculture. This should be done urgently so as to precede the anticipated rapid growth of cage farming on the water bodies. The Uganda Investment Authority has already allowed investors to take up their investment sites especially on Lake Victoria. However, even for those investors who have used the existing EIA guidelines, the aquaculture EIA will be applied again to reinforce the first.

**Improve stakeholder participation and inter-ministerial coordination:** The Health and Environment Linkages Initiative of the World Health Organization and UNEP have identified four key issues that guide sound decision-making at the national level through stakeholder participation and inter-ministerial cooperation. These key issues are incorporated into this study’s recommendations as follows: (1) more effective impact assessment through a systematic and transparent framework where science and policy interact, producing synergy between scientific evidence and policy agendas; (2) valuation of the environment should be interpreted in monetary terms where possible to help measure the rate of environmental degradation; (3) exchanges between stakeholders, scientists and policymakers can range from technical workshops to intersectional government meetings and inter-ministerial level encounters; and (4) building the awareness of environmental problems, tools and policy options among decision-makers and other stakeholders requires sustained and comprehensive communication strategies, which should describe the potential solutions alongside the problems and relate these to successful experiences elsewhere.
Box 10: WHO-UNEP Health and Environment Linkages Initiative (HELI)

The Health and Environment Linkages Initiative (HELI) is a global effort by WHO and UNEP to promote and facilitate action in developing countries to reduce environmental threats to human health, in support of sustainable development objectives. HELI supports a more coherent approach to valuing the services that ecosystems provide to human health as part of decision-making processes. Activities include:

- Projects at country level bringing together diverse government and civil society sectors to assess and recommend integrated policies on environment and health issues (in Uganda it has brought together the Ministry of Agriculture, Animal Industry and Fisheries, the Ministry of Health, and local government extension and medical staff in south-western Uganda).
- Guidance on better use of impact assessment and economic valuation to enhance environment and health decision-making.
- Improving access to policy-relevant knowledge, resources, and tools via electronic media and printed materials in priority areas. These include water quality, availability and sanitation, water-related vector-borne diseases, ambient and indoor air quality, toxic substances, and global environmental change.
- Capacity building for policy action at local, national and regional levels through technical workshops and interactive events that include policymakers, scientists and the public.

Source: UNEP/WHO (2005)

4.2 Prerequisites for implementing the recommendations

For these recommendations to be implemented, first the fisheries central management agency DFR needs to adopt the Fisheries Act, which is currently before parliament. This new act should define the substantial legal mandate of the Uganda Fisheries Authority, the BMUs and the LMOs. In addition, it should define the right of authorities to retain some resource rents from the fish industry for sustainable resource management.

The study findings also observed a gap in the human resource capacity at DFR, at the local government level and at the BMUs and LMOs. Indeed, processors and exporters may be caught off-guard by the introduction of the proposed economic instruments. In addition, to improve the stakeholders’ understanding of the economic instruments, it is critical to ensure that even the civil servants of the DFR are sufficiently trained in all the options of these instruments and that they design them to meet the conditions of the Ugandan market place.

It may be unrealistic to expect that the funds generated from the fisheries resources will be sufficient to fund the management of the resources in Uganda, but there are some donors willing to offer assistance, including the EU and USAID. In the short and medium term these resources will be invaluable in setting up the Fisheries Authority, developing human resources and managing the resource sustainably until such a time when the revenue stream becomes self sustaining.

In addition, to put in place the new Fisheries Act, to build capacity and to secure adequate funding, another pre-requisite is the mobilization of key stakeholders. The parliament of Uganda represents the public who vote them into office. Therefore, any new legislation that comes up should provide sufficient evidence that the opinion of important stakeholders, in this case the fishing communities and domestic fish consumers, are part of the process.

The way forward is to identify the ways and means to further engage all stakeholders, as identified in the table next page.
# Table 5: Further engagement of stakeholders

<table>
<thead>
<tr>
<th>Key stakeholders</th>
<th>Ways of engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parliament of Uganda</strong></td>
<td>The Fisheries Bill is already before parliament. The current process of engagement is to invite members from the natural resources committees to stakeholder workshops. It will be helpful if these members are included in the capacity building process and greater rapport is built on how the committees assess proposals from different sectors.</td>
</tr>
<tr>
<td><strong>Department of Fisheries Resources, MAAIF</strong></td>
<td>The DFR should be on the IAP national steering committee. The DFR should be involved in communicating the results of this study and its future outcomes.</td>
</tr>
<tr>
<td><strong>Fisheries Resource Research Institute (FIRRI)</strong></td>
<td>FIRRI is already involved in several scientific and socio-economic studies and is a major source of information on fish production activities in the country. In future research studies FIRRI should be a major stakeholder.</td>
</tr>
<tr>
<td><strong>LMOs and BMUs</strong></td>
<td>They are expected to represent the majority of Uganda’s fishing community. They should be involved in stakeholder consensus on the use of new instruments. They should also be part of the capacity-building efforts.</td>
</tr>
<tr>
<td><strong>Fish Exporters and Processors Association</strong></td>
<td>Key stakeholders in building consensus on the use of economic instruments in the industry.</td>
</tr>
<tr>
<td><strong>NGOs affiliated to fishing communities</strong></td>
<td>They should be involved in stakeholder consensus-building on the use of new instruments. They should also be part of the capacity-building efforts.</td>
</tr>
<tr>
<td><strong>Ministry of Finance, Planning and Economic Development (MFPED)</strong></td>
<td>MFPED decides on new levies and taxes set in other sectors. MFPED is already a member of the IAP working group. However, they should also be independently involved in stakeholder consultations in recognition of their major role. Their importance is also extenuated by the fact that funds generated from fisheries management will be used by the sector itself rather than taken to the national treasury.</td>
</tr>
<tr>
<td><strong>European Union (EU)</strong></td>
<td>The EU is the major market for Uganda’s fish exports. It also funds many programmes in the fish industry of Uganda. They should be part of the IAP national steering committee representing the fish importers and development partners.</td>
</tr>
<tr>
<td><strong>Food and Agriculture Organization of the United Nations (FAO)</strong></td>
<td>The FAO is important with regards to collection of information.</td>
</tr>
<tr>
<td><strong>Economic Policy Research Centre (EPRC)</strong></td>
<td>Develop tools that have been recommended in this study for current and future IAP including SEA, CGEs, and T21 (these have not been introduced in this publication).</td>
</tr>
<tr>
<td><strong>Ministry of Finance, Planning and Economic Development (MFPED)</strong></td>
<td>Assist in the factional analysis and sensitisation on the advantages of IAP to private sector.</td>
</tr>
<tr>
<td><strong>National Planning Authority (NPA)</strong></td>
<td>Include the findings of this study in the future planning phases for different government sectors.</td>
</tr>
<tr>
<td><strong>Ministry of Health (MoH)</strong></td>
<td>Work with DFR, NEMA and MWLE on recommendations for environmental health among other health concerns in the fisheries sector.</td>
</tr>
<tr>
<td><strong>National Environment Planning Agency (NEMA) / Ministry of Water, Lands and Environment (MWLE)</strong></td>
<td>Take lead role together with DFR in mainstreaming the recommendations of the IAP process in the fisheries subsector.</td>
</tr>
</tbody>
</table>
Another important pre-requisite is the dissemination of the results from this IAP project. This can be done through NEMA’s media programmes on television and radio or in the newspapers. There is already a line of communication between NEMA, the cabinet and parliament. These groups are key to approval of legislation and in many cases approval of findings prior to public dissemination. The fish exporters, processors and fishermen association should also be informed in advance. For a single subsector like fisheries, once the key stakeholders have been identified, as is the case in Uganda, then a rapport between them should be built and communication of the project’s findings should be part of the process. Stakeholder workshops and working committee meetings may also be part of the process. There should be consensus building on important legislation to ensure they have a good chance of success.
4.3 Conclusions

The IAP process has succeeded in bringing together stakeholders from a range of government ministries, agencies, NGOs, business associations, research institutes, development partners such as the European Union, the African Development Bank (AfDB), USAID and private consultants in a project to understand the process to integrate environmental and social issues into economic and trade policies. Another main contribution of this study has been data identification and generation of an assessment process for both the Trade Policy and the Fisheries Policy. Although no changes to these policies are expected immediately, it is hoped that the recommendations will dovetail easily with the two policies.

Openness and receptiveness to integrated assessment are still in an infant phase in Uganda. The wide participation of several stakeholders at the political level, i.e. the parliament of Uganda, and key staff at the ministry level, indicates that the importance of the process is beginning to be understood. However, since IAP is largely and mistakenly perceived as drafting additional environmental regulations rather than assisting individual sectors to achieve sustainability, it may require additional effort to explain this approach to win widespread acceptance and support. The major constraints seem to have come from selecting the appropriate policy with which to pilot the IAP process. By selecting a sector, the IAP National Technical Steering Committee (NTSC) commits itself to working with the stakeholders in that sector. If sufficient cooperation is not forthcoming, it may prove difficult to obtain all the necessary information to complete an IAP.

The other and perhaps more important constraint has been the shortage of studies with sufficient data to help understand the linkages between environment, poverty, social issues and the economy. While at the level of the Poverty Eradication Action Plan (PEAP) considerable work has been done for the subsectors, including fisheries, reviews of interactions in the sectors have been scarce. Therefore building the IAP scenarios may in the future be complimented with case studies from individual sectors. For instance, integrated assessment of the Trade Policy would depend on the work done within the sectors and subsectors on the responsiveness of natural sustainability (for example land on increased production of maize) for the regional market. However, assessments have by large been restricted to economic aspects of markets. Yaron and Moyini (2003) and Nkonya and Kayizi (2002) indicate a considerable amount of soil is lost to soil erosion every year to unsustainable production. A study to model the linkage between trade and soil indicators (other natural resources as well) and development of input-output tables or a social accounting matrix with environmental statistics will provide considerable input for integrated assessment studies. As noted in Box 1 there are some efforts on poverty alleviation and environment indicators that could serve as a model for other case studies.

Identification of key sectors for IAP should start with policies that are close to the heart of environmental and poverty eradication issues. In future studies, the environment and natural resource sectors should be the first targets, and then later the emphasis can shift to other sectors that are the most cross-cutting. The responsibility here lies with the IAP working group in Uganda, with technical support from UNEP.

On a country-by-country basis, the tools for the IAP process may vary but in Uganda, most environmental

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27 Ministry of Agriculture, Animal Industry and Fisheries (MMAIF), Ministry of Water, Lands and Environment (MWLE), MTTI, Ministry of Health (MOH) and Ministry of Local Government (MOLG).
28 NEMA, DFR, Uganda National Bureau of Standards (UNBS), Uganda Bureau of Statistics (UBOS), Uganda Export Promotions Forestry Authority (NFA), Uganda Wildlife Authority (UWA).
29 Advocated Coalition on Development and the Environment (ACODE), representatives from Lake Management Organizations - Lake George Basin Integrated Management Organization (LAGBIMO).
30 Uganda Fish Processors and Exporters Association (UFPEA).
31 Makerere University, National Agricultural Research Organization (NARO), Fisheries Research Institute (FIRI), Economic Policy Research Centre (EPRC).
assessments for large projects, programmes and policies have used SEAs. The scenario building approach used for the integrated assessment of the fisheries policy benefited considerably from other long-term planning frameworks such as the National Planning Vision 2025, where scenario building was also used. The targets set were the same ones used in the scenario building for this study. While Vision 2025 used four scenarios, the three scenarios used in this study are similar to three of the scenarios used for Vision 2025. Therefore this integrated assessment process could be a useful input for future national planning processes, as integrated assessment benefited from the past national planning framework.
References


COMPETE and The European Commission (2001). *The path forward in Uganda’s coffee strategy,* prepared for the presidential conference on export competitiveness


## Annex I: Root cause analysis for the coffee subsector

### Matrix analysis of root causes, actors and opportunities related to a sustainability problem

<table>
<thead>
<tr>
<th>Levels</th>
<th>Root causes (R), Problems (P), Associated actors (A), Opportunities (O), Nomenclature to solve problems with different dimensions and levels.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Economic</strong></td>
<td><strong>Environmental</strong></td>
</tr>
</tbody>
</table>
| **Problems** | - The majority of small holder Robusta coffee farmers rely on the crop as their main source of income  
- Declining production due to coffee wilt, drought and aging coffee trees  
- Uganda’s Robusta coffee exports have declined in volume, value and quality  
- High unemployment in the sector  
- Little value added.  
- Less organic matter in the topsoil as less effort is dedicated to improving soil productivity  
- Forest will be cleared and to create agricultural land for other crops, and make charcoal and timber to supplement low income  
- Increased erosion rates attributed to agriculture.  
- Higher rural-urban migration rates  
- Nutrition of children and young adults likely to reduce because of decreased ability to supplement diet  
- Higher prevalence of disease, due to a reduced ability to afford health care.  
- Liberalization created many players who reduce earnings of farmers  
- Environment and health were not at the centre of interventions  
- Political turmoil lead to inefficiency and collapse of some institutions. | |
| **Local Root causes** | - When the price of the green beans was high, farmers concentrated on it and less effort was spent on other crops  
- Management of coffee deteriorated over the years at farm level  
- Liberalization allows collectors to buy coffee directly, reducing both the quality and price farmers receive  
- The world prices for coffee dropped considerably and farmers | - There is a poor culture of soil fertility improvement in Uganda  
- Since the communities are usually very poor with low job opportunities elsewhere, they turn to forests and other natural resources for their livelihood  
- Opening up of new lands, and burning bushes and forests expose land to soil | - Very little diversified production and the level of importance of coffee in some communities makes them vulnerable to diseases and nutritional problems associated with economic shocks or lower ability to meet their livelihoods  
- People will move in search of jobs or higher natural resource endowments to exploit.  
- Insufficient effort in integrating environmental and health issues into mainstream smallholder agriculture.  
- Agricultural production and NAADS service providers are not fully knowledgeable of environmental and health issues of farmers’ actions. |
**Local Root causes**
- Have no money to manage their fields properly
- Two million people are directly involved in coffee in Uganda and this makes communities vulnerable to shocks.

**Associated actors**
- Coffee farmers, collectors, processors and exporters; regulatory authorities, UCDA, Uganda Coffee Farmers Association, Uganda National Farmers Federation, NARO, LGs, NGOs

**Opportunities**
- Alternate commercial crops
- Planting new trees may rejuvenate production

**National Root causes**
- Liberalization allows collectors to buy coffee directly reducing the quality and price farmers receive
- Little effort to encourage diversified production
- The agricultural sector has always been the dominant employer and there is little change expected

<table>
<thead>
<tr>
<th><strong>Associated actors</strong></th>
<th><strong>Opportunities</strong></th>
<th><strong>National Root causes</strong></th>
</tr>
</thead>
</table>
| Coffee farmers, collectors, processors and exporters; regulatory authorities, UCDA, Uganda Coffee Farmers Association, Uganda National Farmers Federation, NARO, LGs, NGOs | - Alternate commercial crops  
- Planting new trees may rejuvenate production | - Liberalization allows collectors to buy coffee directly reducing the quality and price farmers receive  
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- The agricultural sector has always been the dominant employer and there is little change expected |

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<th><strong>Associated actors</strong></th>
<th><strong>Opportunities</strong></th>
<th><strong>National Root causes</strong></th>
</tr>
</thead>
</table>
| LGs, NAADS, farmers, collectors, processors and exporters; UCDA, Uganda Coffee Farmers Association, UNFF, NARO, NGOs, NEMA | - Sustainable coffee production will lead to improved soil conservation  
- Diversification may lead to better nutrition & food security | - Liberalization allows collectors to buy coffee directly reducing the quality and price farmers receive  
- Little effort to encourage diversified production  
- The agricultural sector has always been the dominant employer and there is little change expected |

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</table>
| Farmers; LGs; Production, Health and Environment departments, NAADS | - Sustainable coffee production will lead to improved soil conservation  
- Diversification may lead to better nutrition & food security | - Liberalization allows collectors to buy coffee directly reducing the quality and price farmers receive  
- Little effort to encourage diversified production  
- The agricultural sector has always been the dominant employer and there is little change expected |

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<th><strong>Associated actors</strong></th>
<th><strong>Opportunities</strong></th>
<th><strong>National Root causes</strong></th>
</tr>
</thead>
</table>
| MFPED, MTTI, NEMA, MoH | - Trade policy reform and other policy reforms | - Liberalization allows collectors to buy coffee directly reducing the quality and price farmers receive  
- Little effort to encourage diversified production  
- The agricultural sector has always been the dominant employer and there is little change expected |

**Additional points**
- Coffee being perennial, farmers are less inclined to uproot the trees but instead open up new tracts of land.
- Monitoring of land utilization is limited to protected areas and areas with a high environmental degradation risk or importance
- Little employment in non-agricultural sectors
- Ministries or departments have developed policy and strategic frameworks with little input from environment and health ministries
### Associated actors

Regulatory authorities, UCDA, Uganda Coffee Farmers Association, Uganda National Farmers Federation, NARO, MAAIF, MTTI, MFPED, local governments, NGOs, international coffee exporters and processors

MAAIF, NAADS, MTTI, UCDA, MFPED, NEMA

MAAIF, NAADS, MTTI, UCDA, MFPED, NEMA, MoH

MAAIF, NAADS, MTTI, UCDA, MFPED, NEMA, MoH, Ministry of Justice

### Opportunities

- The growth of non-coffee agricultural exports
- Growth prospects for niche coffee (sustainable coffee with a market price premium)
- Value added

PEAP, PMA and NAADS review and the National Trade Policy are opportunities for environmental input
- Promotion of sustainable coffee production in some areas

PEAP, PMA and NAADS reviews and the National Trade Policy

PEAP, PMA and NAADS reviews and the National Trade Policy

### International Root causes

- Bumper produce from major world producers lower prices
- Demand for Robusta coffee has been falling
- Reluctance of international processors and importers to allow producers to participate in production
- Being a landlocked country Uganda’s transportation costs cut into profits

- The greater volume of coffee traded in the international market is not grown under environmentally sustainable conditions
- Welfare considerations in international trade are handled by many parties but not adequately
- The major players in the WTO and ICO are themselves importers and processors of coffee and they are not willing to share the revenue

PEAP, PMA and NAADS reviews and the National Trade Policy
### Associated actors

| Government of Uganda (GoU), WTO, International Coffee Organization (ICO), national governments of major exporting and processing countries | ICO, importers, emerging markets in Asia (China), Japan, UNEP | GoU/MTTI, WTO, ICO, importers, Emerging Markets in Asia (China), Japan, UNEP, WHO, ILO | WTO, importers, emerging markets (e.g. China), GoU/MTTI, ICO, Japan, UNEP, WHO, ILO Ministry of Justice |

### Opportunities

- Opening up of international markets and emerging markets
- Emergence of niche coffee (sustainable coffee with a market price premium)
- Growth in the sustainable coffee market offers good opportunities
- Fair trade coffee opportunities are intended to help communities enhance their livelihoods
- The present focus on poverty eradication should place emphasis on fair play in the international coffee trade.
### Annex II: Root cause analysis for the fisheries sector

Matrix analysis of root causes, actors and opportunities related to a sustainability problem

<table>
<thead>
<tr>
<th>Levels</th>
<th>Root causes (R). Problems (P). Associated actors (A). Opportunities (O). Nomenclature to solve problems with different dimensions and levels.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Economic</strong></td>
<td><strong>Environmental</strong></td>
</tr>
<tr>
<td><strong>Problems</strong></td>
<td>• Fish catch sizes may collapse from serious concerns that fish stocks cannot be sustained</td>
</tr>
<tr>
<td></td>
<td>• Fisheries’ incomes may decline considerable if fish catches collapse</td>
</tr>
<tr>
<td></td>
<td>• Average wage of the small scale fishermen has continued to decline as more workers move to participate in the fishing activities</td>
</tr>
<tr>
<td></td>
<td>• Profitability of fishing companies has levelled off</td>
</tr>
<tr>
<td></td>
<td>• Employment levels in the fishery sector increased as demand for fish worldwide and pressure on fish processors to meet their market allocations rise</td>
</tr>
<tr>
<td>Local Root causes</td>
<td>Associated actors</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------</td>
</tr>
</tbody>
</table>
| • Demand for fish by processors  
• Illegal fish trade to local and neighbouring countries  
• Increased effort on a major fisheries especially Lake Victoria, for Nile Perch  
• Open access property rights structure  
• Immediate payment leads to uncontrolled expenditure  
• Low education levels among fishing communities  
• Poor housing, health and sanitary infrastructure  
• Open access nature of most fisheries  
• Tendering system for fishers at local landing sites may not be most efficient | Fishers, Local Governments, DFR (MAAIF)  
Fishers, Local Governments, DFR (MAAIF), DEO /NEMA, NGOs  
Fishers, LGs, DEO/NEMA, DHD, NGOs  
Fishers, LGs, DFR (MAAIF), DEO/NEMA | • Fish farming  
• Alternate commercial crops  
• Introduction of property rights regimes and quotas  
• Introduce economic instruments to improve managements of fish catches  
• Some of the revenue earned from fisheries may be earmarked for health and social programmes  
• Participation through BMus  
• Landing site user fees are more efficient |
| National Root causes | | • High unemployment leads people to flock to fishing villages willing to earn very low wages  
• Decentralization has reduced monitoring between DFR and local government  
• Poor monitoring of livelihoods and implementation of countering measures  
• Poor integration of sectors within government organs at local and national level  
• Capacity of staff to implement measures low |
<table>
<thead>
<tr>
<th><strong>Associated actors</strong></th>
<th>Local Governments, Department of Fishery Resources (MAAIF), MFPED</th>
<th>DFR (MAAIF), NEMA, Local Governments, NGOs</th>
<th>Local Governments, NEMA, DHD, NGOs, MoH</th>
<th>Local Governments, NEMA, DHD, NGOs, Ministry of Justice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Opportunities</strong></td>
<td>• Promotion of fish farming</td>
<td>• Market based instruments and quotas to regulate fish harvesting</td>
<td>• Capacity building for staff</td>
<td>• Introduction of market based instruments and quotas</td>
</tr>
<tr>
<td></td>
<td>• Quotas and market based instruments for fish resource production</td>
<td>• Capacity building for staff</td>
<td></td>
<td>• Capacity building</td>
</tr>
<tr>
<td></td>
<td>• Capacity building for staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>International Root causes</strong></td>
<td>• High demand for fish especially Nile Perch</td>
<td>• High market preference for wild fish instead of farmed fish</td>
<td>• Cost saving measures in international markets and ignorance of fishers conditions</td>
<td>• Ignorance of working conditions of fishers</td>
</tr>
<tr>
<td></td>
<td>• Lack of international agreements to pay for sustainable production of fish</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Associated actors</strong></td>
<td>WTO, Importer nations DFR/MAAIF, MFPED, MTTI/ Fish exporters Association, MWLE, NEMA, NGOs, Researchers</td>
<td>WTO, Importer nations DFR/MAAIF, MFPED, MTTI/ Fish exporters Association, MWLE, NEMA, NGOs, Researchers</td>
<td>WTO, Importer nations, DFR/MAAIF, MFPED, MTTI/ Fish exporters Association, MWLE, NEMA, NGOs, Researchers</td>
<td>WTO, WHO, MoH, Ministry of Justice, MAAIF, MFPED, MTTI/ Fish exporters, MWLE, NGOs, Researchers</td>
</tr>
<tr>
<td><strong>Opportunities</strong></td>
<td>• Participation of international fish market in sustainable fish management</td>
<td>• Participation of international fish market in sustainable fish management</td>
<td>• Work toward improving health and environment</td>
<td></td>
</tr>
</tbody>
</table>
### Annex III: Root cause analysis for the mining sector

#### Matrix analysis of root causes, actors and opportunities related to a sustainability problem

<table>
<thead>
<tr>
<th>Levels</th>
<th>Root causes (R). Problems (P). Associated actors (A). Opportunities (O). Nomenclature to solve problems with different dimensions and levels.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Economic</strong></td>
</tr>
<tr>
<td><strong>Problems</strong></td>
<td>• Inadequate exploration and production despite several deposits spread throughout the country</td>
</tr>
<tr>
<td></td>
<td>• Mining contributes only 1% of GDP and may attract less attention</td>
</tr>
<tr>
<td></td>
<td>• Negative factors e.g. falling world prices for minerals such as copper, lack of spares and inputs, and technical know-how</td>
</tr>
<tr>
<td></td>
<td>• Deforestation in mining limestone and clay extraction, for fuel wood used in brick and limestone kiln</td>
</tr>
<tr>
<td></td>
<td>• Accumulation of toxic minerals in water, fish and crops may transform ecosystems</td>
</tr>
<tr>
<td><strong>Local</strong></td>
<td>• There has been little investment by government and investors in exploration and mining</td>
</tr>
<tr>
<td><strong>Root causes</strong></td>
<td></td>
</tr>
</tbody>
</table>

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---
<table>
<thead>
<tr>
<th><strong>Associated actors</strong></th>
<th>Miners and mining communities, mining investors</th>
<th>Miners and mining communities, mining investors, District Mineral Officers (DMO), District Environment Officers</th>
<th>Miners and mining communities, mining investors, DMO, DEO, DHD</th>
<th>Miners and mining communities, mining investors, DMO, DEO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Opportunities</strong></td>
<td>• Increased efforts to encourage investment in the mining sector by government</td>
<td>• The requirement for an EIA and inspections from DEO may improve environmentally friendly practice</td>
<td>• Increasingly livelihoods and health are being integrated in all projects</td>
<td>• Identification &amp; coordination by stakeholders at LGs is increasing</td>
</tr>
<tr>
<td><strong>National Root causes</strong></td>
<td>• Past exploitation was limited to copper, phosphates and lime</td>
<td>• Insufficient supervision and monitoring and evaluation of mining practices</td>
<td>• In the past poor and inefficient methods and technologies were used</td>
<td>• The capacity of staff was inadequate</td>
</tr>
<tr>
<td><strong>Opportunities</strong></td>
<td>• The capacity of staff was inadequate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Opportunities</strong></td>
<td>• New trade policy and promotion of the mineral sector internationally may attract more investors</td>
<td>• NEMA requires an EIA before a mining project is approved</td>
<td>• Reduction of risks and hazards in workplaces should be enforced in the mining sector properly</td>
<td>• Increasing efforts to make environmental and social issues part and parcel of development programmes</td>
</tr>
<tr>
<td><strong>International Root causes</strong></td>
<td>• The prices of important minerals like copper collapsed as alternatives were discovered</td>
<td>• Environmental considerations were not clearly associated with minerals</td>
<td>• The effect of poor disposal of toxic substances has gained greater prominence in the last 30 years</td>
<td>• Institutionalization of environmental concerns in mining projects in developing countries emerged later</td>
</tr>
<tr>
<td><strong>Opportunities</strong></td>
<td>• Globalization and liberalization of the economy may allow inflows from investors into the sector</td>
<td>• New trade, rules and monitoring by international environmental agencies</td>
<td>• Emphasis has shifted to sustainable harvest of all natural resources</td>
<td>• Adherence to ILO rules has become more important</td>
</tr>
</tbody>
</table>
## Annex IV: Preliminary Assessment - Agricultural sector: Coffee subsector

<table>
<thead>
<tr>
<th>Sustainability issues</th>
<th>Economic indicators</th>
<th>Preliminary assessment</th>
<th>Environmental indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sustainability values:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is important to sustain or</td>
<td>1. Agricultural productivity</td>
<td>1. Age of farmers</td>
<td>1. Rate of pesticide use</td>
</tr>
<tr>
<td>appreciate most?</td>
<td>2. Total farming income</td>
<td>2. Farmer family size</td>
<td>2. Rate of artificial fertilizer use</td>
</tr>
<tr>
<td></td>
<td>3. Average earnings of farmers and farm workers</td>
<td>3. Rural-urban migration rates</td>
<td>3. Energy consumption</td>
</tr>
<tr>
<td></td>
<td>5. Average farm size</td>
<td>labourers</td>
<td>5. Area of land under agriculture</td>
</tr>
<tr>
<td></td>
<td>6. Agricultural employment levels (increase or decrease</td>
<td>5. Ratio of male to female time inputs to farmers</td>
<td>6. Water quality trends</td>
</tr>
<tr>
<td></td>
<td>of job opportunities)</td>
<td>6. Nutritional characteristics of children and young</td>
<td>7. Area sprayed by pesticides</td>
</tr>
<tr>
<td></td>
<td></td>
<td>adults</td>
<td>8. Pesticide residues in water, soil and food</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9. Nitrates and phosphorous losses from agricultural</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>land</td>
</tr>
<tr>
<td></td>
<td>7. Rural employment levels</td>
<td></td>
<td>10. Erosion rates</td>
</tr>
<tr>
<td></td>
<td>8. Rate of creation of food processing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Current problems and risks: What are the urgent problems or risks for priority values addressed here and now? | 1. Uganda’s Robusta coffee exports have been declining in volume, value and quality  
2. Average earning of farmers are likely to reduce further as the majority of Uganda’s 500,000 small holder coffee farmers are Robusta coffee farmers and it is their main source of income  
3. Increased unemployment in the agricultural sector  
4. Declining production due to drought and aging coffee trees  
5. Stagnation in food processing sectors, as Uganda continues to produce raw coffee (green beans) which fetches a small fraction of the final coffee | 1. Higher rural-urban migration rates as income from coffee reduces  
2. Nutrition of children and young adults likely to reduce because of decreased ability to supplement diet  
3. Higher prevalence of disease due to a reduced ability to afford health care | 1. Reduction in organic matter in the topsoil as less effort is dedicated to improving soil productivity due to the low profits  
2. Area of land under agriculture will be increased as forests are cleared to plant other crops, make charcoal, and cut timber to supplement poor income  
3. Increased erosion rates; current estimates of soil erosion is 30 tonnes/ha in highland areas, 90% attributed to agriculture |

| Future problems: What are the sustainability values affected in the future? | 1. Medium term market outlook forecasts continued low prices for commodity coffee  
2. There is unlikely to be a major breakthrough in the coffee processing in the medium term  
3. The impact of coffee wilt disease will continue to lower future volumes and quality of coffee  
4. Employment opportunities in the coffee production and processing likely to reduce in future  
5. Average farm size may be unchanged | 1. Increased rural-urban migration may be anticipated  
2. Unemployment  
3. Increased promiscuity and increased risk of prevalence of HIV/AIDS  
4. Poor nutrition and health for children and pregnant women as there is no or low incomes | 1. Increased soil erosion rates, and organic matter in topsoil will decline considerably  
2. Increasing forest area will be cleared to create room for new crops and a new source of livelihood.  
3. Low incomes will ensure that no soil replenishing is carried out |
**Spatial trade-off**: What are the sustainability risks in areas and for people elsewhere?

1. Incomes of close to 1.5 million people collectors, processors and exporter likely to reduce further.
2. Uganda may lose its market share to emerging African producers e.g. Ethiopia

**Winners and losers**: Who benefits and who is afflicted by the current sustainability problems?

1. Small holder farmers will lose their main source of livelihood
2. Coffee collectors, processors and exporter will lose income
3. National economic growth will slow down as export earning decline
4. Local manufacturers will benefit from excess unskilled, semi-skilled and skilled labour

1. Coffee farmers will lose livelihoods, nutritional status will decline, and exposure to communicable diseases increases
2. Urban residents and authorities will contend with increased population pressure, e.g. pressure on infrastructure and likely increased criminal activity

1. Farmers will lose productivity of their soil
2. Natural resource managers and beneficiaries may observe unsustainable use of forests and pressure on fisheries
## Annex V: Preliminary Assessment - Agricultural sector: Fisheries subsector

<table>
<thead>
<tr>
<th>Sustainability issues</th>
<th>Economic indicators</th>
<th>Preliminary assessment</th>
<th>Environmental indicators</th>
</tr>
</thead>
</table>
| **Sustainability values:** What is important to sustain or appreciate most? | 1. Fish catch sizes, composition and values  
2. Fisheries incomes  
3. Average earnings of fisheries  
4. Profitability of fishing companies  
5. Fishery employment levels (increase or decrease in job opportunities)  
6. Unemployment in fishing communities  
7. Rate of creation of processing businesses | 1. Population of fishing communities  
2. Ratio of independent fishermen to waged workers in the industry  
3. Proportion of fish catch available for consumption and nutritional value of locally consumed fish  
4. Location of fishing areas  
5. Nutritional characteristics of children and young adults in fishing communities  
6. Accidents and mortality rates during fishing activities | 1. Energy consumption  
2. Status of important fish stocks  
3. Population of key bird and mammalian species in fishing areas  
4. Amount of solid waste generated from onshore activities |
**Current problems and risks:** What are the urgent problems or risks for priority values addressed here and now?

1. Serious concerns about fish stocks and catches may collapse if stocks cannot be sustained.
2. Fisheries incomes may decline considerably if fish catches collapse.
3. The average wage of the lower scale fishermen has continued to decline as more workers move to participate in the fishing activities.
4. Average earnings per fisherman are lower.
5. Profitability of fishing companies has levelled off.
6. Today there is little room left for new market participants as the non-profitable processors close down.
7. Employment levels in the fishery sector continue to increase as demand for fish worldwide and pressure on fish processors to meet their market allocations rise.

---

1. Nearly all the Nile Perch captured are exported, although most of the Tilapia are consumed locally.
2. Communities living in fishing villages are known to have a poor diet exacerbated by sanitary conditions.
3. Accidents and mortality rates during fishing activities.
4. There is a high prevalence of HIV/AIDS due to the high level of promiscuity in fishing villages.
5. Impoverished farming communities will not be able to afford health care.
6. Poor nutrition may also result.
7. The number of wage workers has increased as population in fishing villages grows.

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1. Concerns over fish stocks are based on increased effort, which has led to over-fishing.
2. Illegal fishing gear capture immature fish thus interfering with the natural process of stock rejuvenation.
3. Energy consumption.
4. Status of important fish stocks.
5. Population of key bird and mammalian species in fishing areas.
6. Amount of solid waste generated from onshore activities.
Future problems: What are the sustainability values affected in the future?

1. As demand increases and fish harvests begin to decline, export earning may decline.
2. The profitability of fishing companies will decline.
3. Less people will be employed in fish processing and the number of commercial fishers will decline as their effort leads to less and less harvests.
4. Industry focus may shift emphasis to fish farming in the medium term.
5. As fish stocks decline, more aggressive fish harvest techniques with dire sustainability implications may be employed.
6. If not well-regulated fish farming may lead to nutrient enrichment of lake.
7. Illegal fishing gear may risk extinction of target and non-target species of fish.
8. If fish populations reduce substantially the shoreline will be less attractive to birds species that feed on the fish on the lake.
9. Pollution from onland activities threatens fish habitats, through nutrient enrichment and eutrophication which will lower oxygen and subsequently fish stocks.

1. Prevalence of HIV/AIDS and promiscuity may increase further.
2. Impoverished farming communities will not be able to afford health care in future.
3. Poor nutrition may also result.

1. As demand increases and fish harvests begin to decline, export earning may decline.
2. The profitability of fishing companies will decline.
3. Less people will be employed in fish processing and the number of commercial fishers will decline as their effort leads to less and less harvests.
4. Industry focus may shift emphasis to fish farming in the medium term.
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### Spatial trade-off: What are the sustainability risks in areas and for people elsewhere?

1. One million stakeholders in the fish industry risk losing their livelihoods or at least a significant decrease in their income levels
2. Unemployment may lead to migration from fishing villages to urban areas
3. This will lead to increased pressure on social infrastructure in urban areas such as healthcare
4. Promiscuity and HIV/AIDS

**Winners and losers:** Who benefits and who is afflicted by the current sustainability problems?

<table>
<thead>
<tr>
<th>Category</th>
<th>Benefits</th>
<th>Afflictions</th>
</tr>
</thead>
</table>
| Fish trade in the domestic market | 1. 63% of fish is traded in the domestic market  
2. Growth of fish farming industry  
3. Because of their market appeal, Nile Perch and Tilapia dominate the market. Yet the regional market has traditionally been able to use over 10 fish species (such as mudfish, Mukene and others). There should be a focus on utilization of the other species as well | 1. Fishers and their households are extremely vulnerable to diseases and a poor nutritional balance  
2. Urban authorities and government may have to spend more on social infrastructure  
3. As productivity of fish decline, people may shift to unsustainable harvesting of natural forests for timber, charcoal and fuel  
4. More land will be opened up for agriculture by cutting back forestland  
5. Uganda’s fishery resources may collapse, which is a loss to the government and people  
6. Pollution and suffocation of the lake of oxygen may damage some ecosystems within the lake |
## Annex VI: Preliminary Assessment - Mining sector

<table>
<thead>
<tr>
<th>Sustainability issues</th>
<th>Economic indicators</th>
<th>Preliminary assessment</th>
<th>Environmental indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sustainability values:</strong>&lt;br&gt;What is important to sustain or appreciate most?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Natural income</td>
<td>1. Internal migration rates to areas where mining industry is</td>
<td>1. Energy consumption</td>
<td></td>
</tr>
<tr>
<td>2. Regional disparities</td>
<td>2. Trends of employment of children under 14 years</td>
<td>2. Water consumption including irrigation</td>
<td></td>
</tr>
<tr>
<td>4. Creation of employment opportunities</td>
<td>4. Prostitution (adult or child)</td>
<td>4. Conversion of agricultural lands and forests into mining sites</td>
<td></td>
</tr>
<tr>
<td>5. Unemployment rates or ethnic distribution</td>
<td>5. Conflicts between traditional values and practices</td>
<td>5. Proportion of mining expenditure allocated to biodiversity management</td>
<td></td>
</tr>
<tr>
<td>6. Rate of creation of locally-owned businesses supporting mining</td>
<td>6. Ratio of school places to demand</td>
<td>6. Species diversity of sensitive habitats</td>
<td></td>
</tr>
</tbody>
</table>
Current problems and risks: What are the urgent problems or risks for priority values addressed here and now?

1. The value of mineral exports has grown considerably from Ushs 77.6 in 1997 to US$120 million in 2000.
2. Inadequate exploration and production despite the several deposits spread throughout the country.
3. Mining contributes only 1% of GDP and may attract less attention.

1. Mercury and other toxic substances carelessly left by miners enter water streams and the food chain through fish and crops.
2. Disease vectors e.g. mosquitoes breed in pool water accumulated in ditches left behind by miners.

Future problems: What are the sustainability values affected in the future?

1. Value addition to mineral ores and increased mineral trade.
2. Regularising and improving artisan and small-scale mining.
3. Loss of income from agriculture and fishing activities.

1. Higher likelihood of toxic pollutants entering food chain and diseases associated with toxic deposition.
2. Reduction in healthy active life of mine employees.
3. Higher incidence of diseases based on open ditches e.g. malaria.

1. Mining in Uganda has contributed to pollution and damage of landscapes through open ditches left by miners.
2. The mine ditches are a hazard to public and wildlife.
3. Mines cause interference with water flows to streams hence wetlands ecology.
4. Deforestation in mining limestone and clay extraction, fuel wood used in brick and limestone kiln.
5. Accumulation of toxic minerals in water, fish and crops may transform ecosystems.

1. Toxicity not only affects man but other mammals like birds, fish and wild animals.
2. Loss of natural forest to cater for fuel demands of mining industry.
### Spatial trade-off: What are the sustainability risks in areas and for people elsewhere?

<table>
<thead>
<tr>
<th>1.</th>
<th>2.</th>
<th>3.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure improvements</td>
<td>Incomes earned from mining and living conditions may attract promiscuous behaviour leading to HIV/AIDS</td>
<td>High levels of deforestation to cater for fuel demands of mining industry</td>
</tr>
<tr>
<td>Mining sector-related employment and human resource development</td>
<td>Building of social service infrastructure like health units may improve access to health care</td>
<td>Loss of agricultural lands to excess pollution associated with mining</td>
</tr>
<tr>
<td>Income redistribution in the economy may improve livelihoods in less endowed areas</td>
<td></td>
<td>Funds may be used to mitigate adverse effects of the mining and in conserving bio-diversity</td>
</tr>
</tbody>
</table>

### Winners and losers: Who benefits and who is afflicted by the current sustainability problems?

<table>
<thead>
<tr>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment opportunities may increase for local people in the mines</td>
<td>Miners and local communities will be at risk from diseases e.g. malaria</td>
<td>Biodiversity losses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income generated will be spent and improve both local and national economy</td>
<td>Toxicity of water may limit access to clean drinking water</td>
<td>Water quality losses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment in exploration is usually very expensive and is paid for through international loans, which is a heavy burden on the economy</td>
<td>Toxicity will also cause diseases to people and livestock</td>
<td>Deforestation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local infrastructure improvements will provide employment in road construction</td>
<td>Income generated may be used to provide health care for local communities and farmers</td>
<td>Toxic pollution of agricultural land</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Funds may be availed to mitigate adverse effects of previous and future environmental effects</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>