



WorldFish
CGIAR Research Program 3.7 - Livestock & Fish

**UGANDA AQUACULTURE VALUE CHAINS:
STRATEGIC PLANNING MISSION
SUMMARY REPORT**

Jens Peter Tang Dalsgaard, Malcolm Dickson, John Jagwe, Catherine Longley

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www.livestockfish.cgiar.org



Executive Summary

This report presents the findings and recommendations of a strategic planning mission to re-evaluate the feasibility of WorldFish implementing a fish value chain research program in Uganda under the CGIAR Research Program on Livestock and Fish (L&F). The over-arching goal of L&F is to increase productivity of small-scale livestock and fish systems so as to increase availability and affordability of meat, milk and fish for poor consumers and, in doing so, to reduce poverty through greater participation by the poor along animal source food value chains. This will be achieved by making a small number of carefully selected animal source food value chains function better, for example by identifying and addressing key constraints and opportunities (from production to consumption), improving institutional arrangements and capacities, and supporting the establishment of enabling pro-poor policy and institutional environments.

Uganda was identified in 2010 as one of two candidate countries for the development of fish value chains under L&F (the other country being Egypt). However, it was subsequently discovered that the Ugandan aquaculture industry was much smaller than officially recorded, and opportunities to raise funds in the country were poorer than anticipated. It was therefore agreed that the strategic planning exercise should be undertaken to guide decisions on whether or not to go ahead as proposed for Uganda.

The key findings of the mission are as follows:

- Though available data do not appear to show a decrease, lake fish stocks and capture fisheries are widely thought to be in general decline¹ due in large part to over-fishing, compounded by environmental degradation and climate change / variability. There is widespread consensus among stakeholders that the widening supply-demand gap for domestically produced fish products can only be narrowed through aquaculture.
- While aquaculture production in Uganda is much smaller than official figures suggest, it is likely to expand rapidly in the next decade. Significant levels of commercial investments are planned to take place within the coming three years. An industry with around 10,000 tons production capacity will most likely emerge within the next three to five years.
- Uganda currently acts as a regional hub for the supply of aquaculture inputs (feed, seed, fingerlings) and small amounts of aquaculture-produced fish, along with large quantities of wild caught fish and fish products to neighboring countries, including the Democratic Republic of Congo (DRC), Rwanda, Kenya, and perhaps to a lesser extent South Sudan. There is potential for Uganda to take on a more significant regional role in the supply of aquaculture inputs and products in the future.
- Current government policies prioritize fish as a key investment opportunity over the medium term. Aquaculture development is on the policy agenda in the shape of a strategic aquaculture plan, and the government is planning to develop aquaculture parks in up to five gazetted areas including lakes and rivers in the central and western regions as detailed in the recently drafted Aquaculture Parks Policy. Although there are attempts to enhance the enabling environment for the sector, the governance capacity remains weak.
- It is the general perception among development partners that the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) is lacking capacity, incentives, drive and leadership. Both the Government and development partners see the

¹ The scale of the decline due to 'over-fishing' has perhaps been overstated since there are no industrial scale fisheries operations.

private sector and commercial investments as the main drivers of aquaculture, with the public sector providing the enabling context.

- A number of donors are actively supporting agriculture, with more apparently re-entering the sector. A smaller number currently focus on fisheries and/or aquaculture in Uganda and the region with the European Union (EU) being the largest player in Uganda at present. The EU is currently considering support to the aquaculture parks and indicated to the mission that although aquaculture is not a top priority it will not be left aside. If the EU decides to provide support to aquaculture, it is – according to the EU mission in Kampala – very possible that other donors may follow.
- The artisanal fisheries sector is extremely vibrant, but the smallholder aquaculture sector is still struggling. Despite earlier expectations, small and medium enterprise (SME) aquaculture has not yet taken off in Uganda. It remains difficult for producers to make a profit let alone break even. The main constraints and bottlenecks include: feeds (low quality, high prices, volatile supply); lack of market development; absent or weak business development services (e.g. advice, technology and capital); misguided/misinformed producers and new entrants expecting a quick return on investments.
- Farmers are currently being pushed towards high cost aquaculture production systems which potentially run at a loss and will not deliver fish for the poor. There is a need for lower feed conversion ratios (FCR), higher value production systems, and/or lower production (feed) costs. The production models for tilapia and catfish currently promoted are too expensive for smallholders and there is a need for cheaper alternative models, e.g. using locally produced feeds and relying more on natural pond fertilization. Larger, good quality cages are also recommended.
- Because of the very small amounts of farmed fish being produced, prices for are influenced by the relatively low wholesale prices of wild fish from the lakes. However, further away from the lakes, and at the retail level, fish fetches a much higher price. Also, preferences for different types of fish (tilapia; catfish) vary across the region.
- Marketing of farmed fish is a major challenge, despite the high demand for fish. The ‘hub-model’ with clusters of well-organized smallholders built under the USAID Livelihoods and Enterprises for Agriculture Development (LEAD) project offers some promise for further expansion. Aquaculture value chains in Uganda and the East African region are currently disjointed and ineffective; some would argue that there is no value chain at all, only temporal spot markets that occasionally link small numbers of actors who generally operate in inefficient ways. On the other hand, there are functional and well-developed fisheries value chains that operate at local, regional and international levels.

The planned investments from the private sector will support improvements in aquaculture input and output marketing, bringing in opportunities for value chain development that could have impacts on food and nutrition security at local, national and regional levels. However, until the anticipated expansion in aquaculture production actually occurs, we recommend that WorldFish should focus on the fisheries sector, for which there is ample scope for value chain improvements to benefit the poor. Although the study team was tasked to consider whether WorldFish should proceed with an aquaculture research program under the L&F CRP, we feel that confining the focus to aquaculture means that the organization as a whole is missing out on the large potential for research interactions on wild fisheries and fisheries products in Uganda and the region. Lake Victoria alone is one of the world’s largest freshwater fisheries employing many thousand poor fishermen, sustaining many more (poor) men and women working in the value chain and providing animal-sourced protein for poor people in Uganda and the region. The potential short-term and long-term impacts that could be achieved from a wild and farmed fish research-for-development program would be considerably greater than one focused solely on aquaculture value chains.

Specifically, the research objectives of WorldFish should be to:

1. Develop and test models for SME-based, pro-poor, gender equitable fisheries and aquaculture value chain development;
2. Increase access - geographic, but especially economic - to fish by poor consumers and assess nutrition outcomes at intra-household level, as affected by poverty, livelihoods, life cycle, health, ethnic and gender norms;
3. Address the growing environmental issues, in particular surrounding impacts of rapid expansion in lake-based cage farming and its effects on biodiversity and ecosystem services;
4. Address conflict and governance issues around common property resources, especially in relation to lake-based commercial cage farming; and
5. Generate knowledge for more evidence-based, planning, decision- and policy-making processes and help strengthen the emerging policy and regulatory framework for aquaculture and fisheries.

The mission finds that this could be an opportune time for WorldFish to engage in research for development in Uganda and the broader East African region under the L&F program. The commercial aquaculture sector is set to expand significantly in the coming years, albeit from a very limited baseline, stimulating market developments that could benefit poor producers and consumers. WorldFish should position itself ahead of these changes, to develop and strengthen its networks, establish its identity, anticipate and nurture pro-poor research and development opportunities, and gradually build a portfolio in Uganda (with a regional outlook) as a go-to research-for-development facilitator, knowledge partner, and broker of innovative partnerships in the aquaculture (and fisheries) sector. There is an opportunity to influence and help frame a much needed research agenda around key issues such as pro-poor value chain development, animal-source food and nutrition security, gender equity, and environment impact, before and during the early stages of this widely anticipated private sector take-off. These vital research and development issues, if not driven by agencies like WorldFish are in danger of receiving inadequate attention.

There are potential risks surrounding such an engagement, however, relating to a weak policy environment and the lack of clarity around commitment by the Government as well as development partners to financing the interventions needed to establish the enabling framework, secure public goods, and help drive the sector forward sustainably. There are signs though that a stronger enabling framework is emerging encouraged by the national leadership.

A key challenge will be in raising the necessary funds to establish a permanent in-country presence and build a sizeable portfolio if it is focused only on the aquaculture sector which, at present, makes a very limited contribution towards livelihoods, employment and the economy. It is therefore proposed that the initial focus should be on fisheries and aquaculture, until such time that the aquaculture sector has expanded sufficiently to warrant exclusive focus. Given this scenario, five options are presented:

1. Establish presence from early in 2013, initially for three years, under the umbrella of a CGIAR partner, with a **full-time representative**/Value Chain Coordinator based in Uganda;
2. Establish presence from early in 2013, initially for three years, under the umbrella of a CGIAR partner, with a **part-time representative**/Value Chain Coordinator based in Uganda;
3. No staff recruitment in 2013 but initiate activities in Uganda/East African region by **drawing on existing WorldFish staff** and others to undertake and guide initial

activities until such time that a more substantive portfolio and income streams have been generated;

4. **Delay decision** on Uganda/East African region and re-assess the situation in two to three years to see whether the planned private sector investments have led to increased aquaculture production levels and improved marketing and whether there is genuine commitment from the Government and development partners to provide necessary support; and
5. Undertake **another feasibility mission to another country** (e.g. Ghana, Nigeria, Malawi, Zambia) to determine whether or not there is a better alternative to Uganda/East Africa.

The first three options assume availability of L&F seed money to cover cost of staff and initial field work (e.g. rapid value chain assessments; market studies), until such time that additional income has been generated. Very recent information from the Consortium Office received via ILRI, however suggests non-growth for L&F with a 2013 budget identical to the 2012 budget, leaving insufficient funds to start up a Uganda presence for the time being or provide seed money for initial field research. The necessary funds will therefore have to be raised from other sources. WorldFish is already engaged in three large projects in Uganda/East Africa (ASARECA, AFPSAN, STARGO) and there are three more initiatives in the pipeline (EU-Fish Trade, ADRAS, COMESA-Women in Business), the first of which has recently received confirmation of funding. Planned activities under these projects offer a basis from which to expand.

Opportunities for further fundraising include the development of broad, regional proposals that address the 'big questions' prepared together with CGIAR partners and submitted to larger donors such as the Gates Foundation, IFAD², and others; working in partnership with national and regional bodies (e.g. NEPAD, COMESA, ASARECA, PAF, NARS) to develop joint proposals relating to the proposed research agenda³; private sector funding; and competitive research grants.

1. Findings and conclusions: the role of WorldFish in Uganda and East Africa

1.1 Summary of findings

The key findings of the mission are as follows:

- Lake fish stocks and capture fisheries are generally thought to be in general decline due in large part to over-fishing, compounded by environmental degradation and climate change / variability. There is widespread consensus among stakeholders that the widening supply-demand gap for domestically produced fish products can only be narrowed through aquaculture. The official statistics however, do not show an overall marked decline. This could be a reflection of the difficulties in collecting accurate data rather than a true reflection of the capture fisheries situation, or it could suggest that the situation is not as grave as generally perceived.
- While aquaculture production in Uganda is much smaller than official figures suggest, it is likely to expand rapidly in the next decade. Significant levels of commercial

² ILRI sees potentially large, longer term opportunities for L&F with these two donors in East Africa.

³ During the mission ASARECA expressed keen interest to work more with WorldFish on resource mobilization for aquaculture research activities in the East African region.

investment are planned to take place within the coming three years. An industry with around 10,000 tons production capacity will likely emerge within the next three to five years.

- Current policies (e.g. DSIP) prioritize fish as a key investment opportunity over the medium term. Aquaculture development is on the policy agenda in the shape of a strategic aquaculture plan, and the government is planning to develop aquaculture parks in up to five gazetted areas including lakes and rivers in the central and western regions. Although there are attempts to enhance the enabling environment for the sector, the governance capacity remains weak (security of tenure at cage sites; weak civil rights; environmental issues).
- MAAIF is lacking capacity, drive and leadership. Working with government in the agriculture sector is not easy. Both the Government and development partners see the private sector and commercial investments as the main drivers of aquaculture, with the public sector providing the enabling context.
- A number of donors are actively supporting agriculture, with more apparently re-entering the sector. A smaller number currently focus on fisheries and/or aquaculture in Uganda and the region with the EU being the largest player in Uganda at present. The EU is currently considering support to the aquaculture parks. The EU indicated to the mission that although aquaculture is not a top priority it will not be left aside.
- While the artisanal fisheries sector remains very vibrant the smallholder aquaculture sector is still struggling. Despite earlier expectations, SME aquaculture has not yet taken off in Uganda. It remains difficult for producers (even relatively well-established commercial companies such as Source of the Nile) to make a profit let alone break even. The main constraints and bottlenecks include: feeds (low quality, high prices, volatile supply); lack of market development; absent or weak business development services (e.g. advice, technology and capital); misguided/misinformed producers and new entrants expecting a quick return on investments.
- Farmers are currently being pushed towards high cost production systems which potentially run at a loss and will not deliver fish for the poor. There is a need for lower FCRs, higher value production systems, and/or lower production (feed) costs. The production models for tilapia and catfish currently promoted are too expensive for smallholders and there is a need for cheaper alternative models, e.g. using locally produced feeds and relying more on natural pond fertilization.
- Prices for farmed fish are influenced by the relatively low wholesale prices of wild fish from the lakes. Further away from the lakes, where fish farming has not yet developed to meet the gap, fish fetches a much higher price, as would be expected. Preferences for different types of fish (tilapia; catfish) vary across the region.
- Marketing is a major challenge, despite the high demand for fish. The 'hub-model' with clusters of well-organized smallholders built under the LEAD project offers some promise for further expansion. Aquaculture value chains in Uganda and the East African region are currently disjointed and ineffective; some would argue that there is no value chain at all, only temporal spot markets that occasionally link a very small number of actors who generally operate in inefficient ways.
- Uganda is currently a regional hub for supply of capture fisheries and aquaculture products (feed, seed, fingerlings, live and processed fish) to neighboring countries, including the Democratic Republic of Congo, Rwanda, Kenya, and perhaps to a lesser extent South Sudan. There is potential for Uganda to take on an even more significant regional role in the future.

The conclusion from these findings is that the planned increase in commercial aquaculture production will most likely stimulate market development, expanding the current value chains

(such as they are), and bringing in opportunities for value chain improvement that would have impacts on food and nutrition security at local, national and regional levels. Given the size of the existing capture fisheries and the anticipated emergence of a strong commercial aquaculture sector in Uganda, there is an opportunity for WorldFish to become a significant player in Uganda. This could be as a broker/facilitator of partnerships helping to identify, address and remove obstacles to private, commercial sector value chain development while ensuring that enough attention is given and knowledge generated around ASF and nutrition security, food safety, poverty, gender equity and environment issues and impacts – all vital research and development themes that otherwise are in danger of being ignored.

In the smallholder aquaculture sector WorldFish could build on the good foundation laid for instance by the USAID LEAD project with emerging smallholder hubs. At a technical level, there is a need for alternative, low-cost production models for smallholders in particular.

Persistent weaknesses on the government side, notably in MAAIF (to a lesser extent in NARO) and a rudimentary policy/regulatory environment, however present an important risk. There are signs though that the national leadership is prioritizing aquaculture as a future growth area. This all points towards engaging more with the private sector while cultivating good working relationships with public partners and government counterparts and seizing opportunities to help shape an emerging policy and regulatory environment for more evidence- and knowledge-based planning and decision-making.

Fundraising will be a major challenge. This can be partly addressed by adopting a regional approach rather than focusing on Uganda alone and by broadening the scope to cover both aquaculture and fisheries.

1.2 The role of WorldFish in Uganda and the East African Region

The overall aim of the Livestock and Fish CRP is to increase affordable ASF supplies to poor consumers by poor producers. The program selected its focal value chains and countries through a review process applying the following criteria: potential for market expansion; potential for the poor to benefit from the market expansion; existence of supply constraints which research could aid in addressing; supportive policy environment; and existing interest among stakeholders in working on improving the chain (see Annex 1). All of these factors currently exist in Uganda, suggesting that it is an appropriate country of focus for L&F. Regional linkages are such that the development of value chains in Uganda would benefit poor producers (through the supply of inputs) and consumers (through increased availability of fish products) in neighboring countries such as DRC, Rwanda and Kenya.

As stated above, the Ugandan aquaculture sector will likely undergo rapid and substantial growth in the coming years, driven primarily by the private sector and spearheaded by a few medium to large-scale commercial companies, including foreign investors. WorldFish can help ensure that essential research for development issues around poverty alleviation, food and nutrition security and related gender issues⁴, ecological footprints, and development and dissemination of international public goods get on to the agenda and receive the attention they deserve. While increasing availability of fish through development of the aquaculture sector is essential in improving nutrition and food security, increased consumption by those who need it most will only result if issues around access and utilization are also addressed. Much of the expansion of the commercial sector is likely to be through lake-based cage aquaculture, which unless properly planned and regulated can create environmental problems and loss of ecosystem services (fishing, potable water), to the poor and vulnerable (Beveridge 2004, Beveridge & Brummett, in press), with consequent conflict.

⁴ The Uganda Nutrition Action Plan (GoU, 2012a) focuses on young children and mothers, emphasizing proper nutrition for women of reproductive age and laying a nutritional foundation for an intelligent, creative, and healthy population from which to build a better future.

The CGIAR Livestock and Fish Research Program aims to work with fish farmers at various levels to develop sustainable pro-poor, gender equitable value chains to improve the food and nutrition security of vulnerable consumers. WorldFish would seek to achieve this for aquaculture in Uganda/East Africa region by bringing its research and capacity building skills, its focus on gender and its approach to partnerships to bear on the sustainable development of the sector. This is entirely consistent with Uganda's current National Development Plan (see Section 2.1). Specifically, the research objectives of WorldFish would be to:

1. Develop and test models for SME-based, pro-poor and gender equitable aquaculture value chain development;
2. Increase access - geographic, but especially economic - to fish by poor consumers and assess nutrition outcomes at intra-household level, as affected by poverty, livelihoods, life cycle, health, ethnic and gender norms;
3. Address the growing environmental issues, in particular surrounding impacts of rapid expansion in lake-based cage farming and its effects on biodiversity and ecosystem services;
4. Address the growing conflict and governance issues around common property resources, especially in relation to commercial cage farming.
5. Generate knowledge for more evidence-based, planning, decision- and policy-making processes and help strengthen the emerging policy and regulatory framework for aquaculture

Possible research issues under these key areas are further elaborated in Annex 7.

As elaborated in Section 3.5, the potential short-term impacts (within two or three years) that can be achieved from the proposed research program would likely be considerably greater if the research agenda were to focus on fisheries as well as aquaculture value chains, particularly in relation to objectives 1, 2 and 4 above.

1.3 Candidate value chains and geographical regions in which to work

Given the proposed research areas outlines above, the recommendation is to focus on Central/Eastern Region (due to SoN and Greenfields partnerships, environmental and governance issues on Lake Victoria, presence of active farmer groups and cooperative society (WAFICOS), anticipated sites for Aquaculture Parks, trade with Kenya and potential cross-border links with Kenya Gatsby Trust and the German-Israel-Kenya trilateral project), and Western Region (due to presence of active farmer groups, trade with DRC, environmental and governance issues on Lake Albert, willing partners and on-going work by partners, anticipated sites for Aquaculture Parks). Within each region, we may consider selecting sites that are both urban and rural, and that are located both near the lakes and further away from the lakes.

The points below provide some of the key criteria and associated possibilities for the identification of candidate value chains / geographical areas:

- Areas where SME farmers are already active and there is the potential for value chain development. The LEAD project has established out-grower fish farmer groups in Bushenyi and Kasese (Western Region), Kaberamaido (Eastern Region), Amuru/Gulu and Kitgum (Northern Region). Kabeiura Farmers Ltd (Bushenyi) is a particularly successful group that has good capacity for catfish seed production and has established profitable market linkages in exporting fish and seed to DRC. These groups may be need further support in order to mature and be able to sustain themselves following the end of the LEAD project in October 2012. Other SME groups are those supported by SCAPA (Central Region) and UAOGRESCUE (Lakes Albert and Nakivale in Western Region; Lakes Bisina and Kyoga in Northern Region; and a water reservoir in the Karamoja region).

- Areas where there is lack of geographic access to fish by poor consumers, i.e. further away from the lakes, or in areas where fish for consumption is simply not available, e.g. near the shores of Lake Albert where fish stocks are very low and mukene is harvested for animal feed, not for human consumption.
- Areas with large populations of poor consumers who lack economic access to fish. There is likely to be higher density of poor consumers in urban and peri-urban areas than in rural areas.
- Areas where environmental concerns are apparent. Such areas would include lakes where cage farming is expanding (e.g. Lake Victoria); any of the sites for the proposed Aquaculture Parks – the sites have yet to be determined; and also areas where oil fields are being developed (Lake Albert).
- Areas where there are growing conflict and governance issues around common property resources. Such areas would include lakes where cage farming is expanding (e.g. Lake Victoria; and any of the sites for the proposed Aquaculture Parks).

Other considerations in the selection of areas in which to work might include the presence of willing partners; possible overlaps with ILRI's pig value chain activities; areas where WorldFish and its partners have previously or are currently working (e.g. Blake's governance work on Lake Victoria; ASARECA project; AFSAPN; possible ADRAS project; SoN; Greenfields; Dr Kabahenda's nutrition projects; Aquaculture Consultants' farmers' database; cross-border links with Kenya Gatsby Trust and German-Israel-Kenya trilateral project, etc); and areas where cross-border linkages might attract funding for regional activities. We should also consider areas targeted by large-scale investors where opportunities for framing a pro-poor consumer and pro-environment agenda may emerge.

It will also be necessary to focus on areas to be identified by the Ministry of Agriculture, Animal Industry and Fisheries for the development of Aquaculture Parks. Potential sites are currently being explored, and the EU-funded COWI consultancy to take place in November 2012 will undertake the feasibility studies. In addition, MAAIF has identified 31 districts⁵ as suitable for fisheries and aquaculture development based on both natural and socio-economic factors. The districts identified are located around the country's major water systems including Lake Victoria Crescent, Lake Kyoga basin, River Nile catchment, Edward-George complex and the Koki lakes.

1.4 Potential threats to the proposed research / development agenda

The findings of the mission suggest that there are a number of potential threats to the proposed engagement in Uganda by WorldFish:

- Scarcity of funding for research. See Section 5.2 for an overview of fundraising approaches.
- Lack of effective extension services in Uganda and lack of practical aquaculture training among extension workers. This can be overcome by potential to work with LEAD lead farmers; adopting 'best practice' from organizations such as the International Centre for Research in Agriculture (ICRA); and working with NGOs and other agencies (e.g. WAFICOS) on the ground in collaboration with an emerging private sector.

⁵ These districts are: Mayuge, Jinja, Bugiri, Busia, Mukono, Mpigi, Wakiso, Masaka, Rakai, Mbarara, Bushenyi, Ntungamo, Kasese, Hoima, Masindi, Nebbi, Gulu, Adjumani, Arua, Kamuli, Soroti, Lira, Iganga, Tororo, Pallisa, Mbale, Apac, Kabiramaido, Kabarole, Kamwenge and Kyenjojo.

- Weak capacity of government players and a general sense of malaise. Partnerships with private sector should be prioritized.
- Threat of conflict over access to resources – poaching, theft, weak social capital. Research should be undertaken into governance issues to find ways to address these problems.
- Political instability and civil conflict including possible political instability with next election (2015); potential insecurity in northern Uganda due to Lord's Resistance Army, tensions in South Sudan, etc. A more detailed analysis is required; if necessary, WorldFish should avoid working in the North and develop contingency plans for potential periods of instability.
- Within WorldFish, diverting scant resources on an over-stretched program may detract attention from other activities. This can be avoided with adequate funding.
- Are the Chinese a threat or opportunity? Weak institutional frameworks may result in introduction of alien species (carps) and pathogens and environmental consequences, as occurred in Zambia with introductions of fish from Thailand⁶. On the other hand, Chinese investments will bring opportunities for economic development and expansion of the aquaculture sector; market development; increased quality and quantities of seed and feed.
- The policy and regulatory framework around aquaculture is incomplete. While the intention is to put in place policies and updated regulations and guidelines the process may face both bureaucratic and political challenges and delays. At the same time this represents an opportunity for WorldFish and partners to influence decision-making.

2. Recommendations

Overall the mission finds that this could be an opportune time for WorldFish to engage in research for development in Uganda and the broader East African region under the L&F program. The commercial aquaculture sector will likely expand significantly in the coming years, stimulating market developments that may be of limited benefit to poor producers and consumers. WorldFish should position itself ahead of these changes to develop its network, establish its identity, anticipate and nurture pro-poor research and development opportunities, and gradually build a portfolio in Uganda (with a regional outlook) as a go-to research-for-development facilitator, knowledge partner, and broker of innovative partnerships in the aquaculture sector. There is an opportunity to influence and help frame a much needed research agenda around key issues of pro-poor value chain development, food and nutrition security, ecological services and impacts, and so forth.

Until the anticipated expansion in aquaculture production actually occurs, however, we recommend that WorldFish should focus on the fisheries sector, for which there is ample scope for value chain improvements to benefit the poor. Although the study team was tasked to consider whether WorldFish should proceed with an aquaculture research program under the L&F CRP, we feel that confining the focus to aquaculture means that the organization as a whole is missing out on the important potential for research interactions on wild fisheries

⁶ The importation of live tilapia from Asia to southern Africa sometime around 2006 is thought responsible for the transfer of the fungal-based (*Aphanomyces invadans/piscida*) epizootic ulcerative syndrome (EUS) into the Zambezi River system, where it has infected some 25 fish species, with unknown effects on livelihoods (Bondad-Reantaso *et al.* 2012).

and fisheries products in Uganda and the region. Lake Victoria alone is one of the world's largest freshwater fisheries employing many thousand poor fishermen, sustaining many more men and women working in the value chain and providing animal-sourced protein for poor people in Uganda and the region. The potential short-term and long-term impacts that could be achieved from a wild and farmed fish research-for-development program would be considerably greater than one focused solely on aquaculture value chains.

There are important potential risks surrounding such an engagement relating to a weak policy environment and the lack of clarity around commitment by the Government of Uganda as well as development partners to resourcing the interventions needed to establish the enabling framework and take the sector forward. The greatest challenge from a WorldFish perspective will likely be in raising the necessary funds to establish a real presence. Given this scenario, five options have been identified, and various avenues for future fundraising are put forward.

2.1 Options for implementation

Five options are presented in table 1 below, together with the advantages and risks associated with each. Suggestions for mitigating some of the risks have also been included. The first two options involve establishing a presence in Uganda; the third option involves establishing activities without a presence; the fourth option is to defer a decision until funding opportunities look more favorable; and the fifth option is to consider alternative countries. The cost implications of Options 1 and 2 are detailed in Annex 8. Note also that very recent information from ILRI suggests that the 2013 L&F budget will remain identical to the 2012 budget, leaving little room for seed money in Uganda.

Table 7. Options, advantages and risks

	Option	Resource Mobilization Strategy *	Advantages	Risks and management suggestions
1	<p>Establish presence early in 2013, initially for three years, under the umbrella of a CGIAR partner, with a full-time representative/Value Chain Coordinator</p> <p>Role of Coordinator would be to network among local and regional partners for fundraising purposes and also supervise initial research activities (see Note below). Coordinator would be local/regional recruit. Purchase admin/support staff services from ILRI or other CGIAR center. Pay for use/rent of ILRI or other center vehicles + use of taxis.</p> <p>Work under Bioversity's country agreement with MOFA until WorldFish has its own country agreement (same approach as ILRI).</p> <p>High cost, high risk option</p>	<p>'Soft launch' advisable for presentation reasons; 'hard launch' only possible once long-term funding secured.</p> <p>Scope funds for public-private R&D partnerships; scope within Uganda and in the East Africa region; work with ILRI-Uganda and ILRI-Kenya on development of L&F wide concept notes and proposals bringing in support from WorldFish Zambia and Penang offices</p>	<p>Local and regional networking would enhance fundraising efforts.</p> <p>Displays serious commitment to partners and L&F on the part of WorldFish.</p>	<p>If additional funding is not forthcoming then the presence may need to be closed after two-three years, with inherent reputational risk. To be managed by regular review.</p> <p>Careful partner selection and avoid becoming associated with the 'wrong' individuals/partners.</p> <p>Full time salary costs would limit available funding for initial research activities.</p> <p>Need to avoid possible (misplaced) assumptions among WorldFish staff that Coordinator is solely responsible for fundraising. Needs to be managed by ensuring that FTE and travel budget available for other L&F staff to support fundraising efforts.</p> <p>The Bioversity/ILRI compound is an option, but as other CGIAR centers (e.g. CIP) plan to recruit more staff, space may become scarce. We can also explore possible office space at the IFPRI compound.</p>
2	<p>Establish presence from Q1 2013, initially for three years, under the umbrella of a CGIAR partner, with a part-time representative/Value Chain Coordinator</p>	<p>As above. Money saved on full-time salary cost (\$80,000) could be spent on initial research activities and fundraising efforts by existing L&F staff and others.</p> <p>Local and regional networking would</p>	<p>Slightly less costly option than (1); money saved on staff costs could be directed towards fundraising efforts and initial</p>	<p>May be difficult to recruit suitable part-time staff who is committed long-term; use of consultant may have 'loyalty' issues in representing WorldFish. To be managed by regular review.</p> <p>Possible lack of continuity if funding is raised for permanent office – existing p/t staff may not want</p>

	Medium cost, slightly less high risk option	<p>enhance fundraising efforts.</p> <p>May allow for greater input from existing L&F staff and others to fundraising efforts, i.e. more of a team effort to fundraising; less reliance on in-country Coordinator.</p>	<p>research activities.</p> <p>Displays some level of commitment to Uganda on the part of WorldFish.</p>	<p>full-time job.</p> <p>If additional funding is not forthcoming then the office may need to be closed after two-three years, with inherent reputational risk.</p> <p>Would need to avoid becoming associated with the 'wrong' individuals.</p>
3	<p>No staff recruitment in 2013 but initiating activities in Uganda/the region by drawing on existing WorldFish staff and others to undertake and guide initial activities until such time that a more substantive portfolio and income streams have been generated</p> <p>Low cost, medium risk option</p>	<p>Money saved on salary costs could be spent on initial research activities and fundraising efforts by existing L&F staff and others. Would require regular review and elaboration of indicators necessary to determine when to establish presence / office (e.g. expansion in commercial aquaculture production; changes in policy environment; funding available; etc.).</p>	<p>Offers more flexibility in how existing L&F funds can be allocated: allows for initial research activities and fundraising efforts</p> <p>Fundraising would necessarily be a team effort by existing L&F staff and others.</p>	<p>Difficult to do local and regional networking; would have to rely on ILRI staff in Kampala (and Nairobi) as well as other partners.</p> <p>May be interpreted by partners as lack of commitment on the part of WorldFish.</p>
4	<p>Delay decision on Uganda/East African region and re-assess the situation in three years to see whether the planned private sector investments have led to increased production levels and improved marketing.</p> <p>No cost option with reputational risks</p>	<p>Explore options for transferring technologies and knowledge from Egypt to other parts of Africa (and beyond).</p>	<p>CRP resources to support Egypt VC work with consequent higher potential for success in Egypt,</p>	<p>Reputational risks: having already delayed decision once before, this will be interpreted by potential partners as lack of seriousness on the part of WorldFish. Might be interpreted by ILRI as WorldFish lack of commitment to L&F program?</p> <p>Future fundraising would be difficult without some kind of commitment from WorldFish. Future partnership building (in Uganda) might also become more difficult unless our intentions are clearly backed by commitment/ resources.</p> <p>Current staffing levels in Egypt are insufficient to be able to absorb additional resources. Risk of putting almost all resources into only one value chain (Egypt tilapia).</p>

5	<p>Undertake another feasibility mission to another country (e.g. Ghana, Nigeria, Malawi, Zambia) to determine whether or not there is a better alternative.</p> <p><i>Low cost, medium risk option</i></p>	TBD (mission would need to assess new resource mobilization options).	Opens up potential for identifying strong candidate value chains in country with clear commitment.	Delays to the start of the second value chain under the L&F research program would reduce potential for short-term impacts.
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* **Note:** Options 1, 2 and 3 would all involve the initiation of field activities with L&F funds and new bilateral monies, e.g. for an initial market study/value chain assessment, a follow-up on the USAID-LEAD smallholder project, and research on constraints/bottlenecks to value chain development (e.g. research on local feed options and feed quality including a CFFRC studentship shared between Egypt and Uganda), etc. depending on levels of funding. Recent news from ILRI indicate non-growth in the overall L&F budget from 2012 to 2013 potentially leaving no seed money for Uganda.

2.2 Resource mobilization

While there are opportunities for leveraging small amounts of research funding in the near future (e.g. from ADRAS (if successful), ASARECA, or the EU-funded Fish Trade Project), there are no apparent or immediate opportunities for large-scale funding. Building up a sizeable portfolio with a larger revenue stream may therefore take time and require a sustained presence and concerted effort.

The mission found no readily available funds from conventional bilateral donors in country at the moment. EU is the most likely option in 2013, if the Aquaculture Parks initiative goes ahead. If the EU decides to fund the Aquaculture Parks initiative, then other bilateral donors might come on board, but again this is all tentative. A clearer picture around the EU decision is expected during the second quarter of 2013.

Limited CRP core funds means that any allocation of CRP funds to Uganda / East Africa could detract from other WorldFish L&F activities.

The following funding alternatives should be explored:

- i) Develop broad, regional proposals with ILRI on ASF / health / nutrition and/or environmental issues that address the 'bigger strategic questions' under L&F. Possible donors might include Gates Foundation, IFAD (engage in on-going dialogue with ILRI) and others. Next steps might include a review of possible donors and their priorities; big 'think pieces' at high level (to bring issues onto the agenda) and at L&F component level (feeds, breeding, gender, etc.).
- ii) Strengthen and develop research-for-development networks / partnerships with national and regional bodies (e.g. NEPAD, COMESA, ASARECA, PAF, NARS) to develop joint proposals relating to the proposed research agenda. WorldFish may not be a key partner, but this is consistent with the current CGIAR approach to divert more support to local and regional bodies and can leverage funds. Another potential option is linking up with the Nile Basin Development Challenge (NBDC) as part of the Challenge Programme of Water and Food on joint activities under CRP5 on Water, Land and Ecosystems. Some of the interventions are about the creation of small reservoirs which should be exploited as Multiple Use Systems, and one potential would be to rear fish as an additional source of protein. Next steps might include a review of regional bodies and their engagement in aquaculture and – crucially - their capacity to deliver. The risk of this approach is that it may take us out of our priority areas of focus if potential partners have other priorities.
- iii) Possible private sector funds might include those listed below. Fundraising through the private sector requires a very different approach to fundraising through more conventional channels and can be enhanced by insights from fundraising consultants⁷ and others who are experienced in this approach and in forming public-private-partnerships within research.
 - a. Private funding for cooperative development, as has been achieved in Aceh and other parts of Southeast Asia (see Phillips et al, 2012) through the WorldFish Incubator business model.
 - b. Medium and large scale aquaculture companies that are interested in funding research and development on specific issues that would be of benefit to their company. For example, possible collaboration with Source of the Nile on genetic development.

⁷ Such as Dr Richard Steckel (see www.addventurenetwork.org/) who has worked with ICRISAT and other centres in the past.

- c. Corporate Social Responsibility funding through oil companies (Total, Tullow Oil) or through aquaculture players, e.g. Commercial Aquaculture Producers for Africa (CAPA).
- iv) Competitive research grants through calls for proposals – may offer limited funding for research, but grants are typically small and internal competition can limit the possibilities for Uganda/EA. Assuming a success rate of one in three, substantial time could be absorbed by pipeline development.

Whichever research funding options we decide on we will need to be strategic in terms of effort expended, likely returns, and partnership development potential.

Other noteworthy initiatives and potential partnering and funding opportunities include: a newly initiated trilateral Kenya-Israel-Germany project on tilapia value chains, which might extend into Uganda in future; WorldFish is currently working with public and private sector partners in Kenya, Tanzania and Uganda in developing aquaculture in the region (see <http://www.worldfishcenter.org/our-research/ongoing-projects/african-aquaculture-development-beyond-the-fish-farm>). Although the project finishes at the end of 2013, there are further opportunities to apply for funding in 2014. NEPAD-FAO Fish Program has a strong focus on aquaculture, in support of the NEPAD Action Plan for the Development of African Fisheries and Aquaculture. The Aquaculture Working Group (AWG) is a region-wide body established within the Partnership for African Fisheries (PAF) to address challenges inhibiting aquaculture and fisheries research and development in Africa. It is also aligned to the NEPAD 'Fish for All' Abuja framework for aquaculture development.