

Training and Outreach in Uganda and Surrounding Nations

Production System Design and Best Management Alternatives/Activity/09BMA02AU

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INTRODUCTION

Research, extension and education can contribute greatly to enhancing aquacultural production in a sustainable way and to reducing poverty, but achievements have generally fallen short of expectations in Africa (Sanginga et al. 2008). Farmers trust the experience and knowledge of others who are in situations similar to their own. Their desire to meet and talk with each other has spurred the formation of groups and networks to foster informal gatherings and more formal mechanisms of association to facilitate peer-to-peer learning. Such learning groups are most effective when they have a targeted membership like fish farmers. If member perspectives are too diverse, then participants tend to become disenchanted because the results do not apply to their situations (Barrett and Ewert 1998).

Peer-to-peer learning and support systems become increasingly important in the context of privatized extension (Klerkx and Leeuwis. 2009), but in Africa there is often little or no reliable extension system to privatize. External donors endeavor to foster private, non-profit mechanisms that will be sustainable and provide the information and organizational services that fish farmers need to build an industry.

Farmer innovators appreciate exchange and study visits as ways of gaining new experience, knowledge and techniques, which they informally experiment on at home (van den Ban and Hawkins 1998). Farmer-to-farmer communication is more effective when visitors and hosts are well prepared, and if both groups review the usefulness of the exchange and deliberate on the reporting of lessons learned.

Previous experience with farmer innovators in agricultural development suggests that study tours and farmer-to-farmer interaction led to significant levels of advancement in production practice. The project encouraged innovators to organize themselves into clusters of farmers and exchange experiences within and between clusters. In Tanzania, some farmer innovators started forming local groups with neighboring farmers after returning from the exchange visits. It is not easy to fully integrate the farmer innovation approach to participatory research and extension into the regular activities of national institutions. The concept of farmers as innovators and researchers is still new for many decision-makers. Thus, there are manifold ways that innovator farmers that share a common interest in a focal enterprise such as fish culture will associate themselves to gain the benefits of mutual support and collaboration.

Outreach is extension, and implies regular and purposeful communication with stakeholders and beneficiaries at the various intermediate and local levels (Kerrison 2005). When standard forms of

literacy-based and electronic communication are no longer available, then outreach takes place in the traditional extension way, with physical visits, dialogues, community meetings etc. Where adequate mass communications, electronic or literacy-based media can be used, mobile phones, email etc. then the need for travel and face-to-face meetings is obviously reduced (Kerrison 2005). The results (and other information) are disseminated through a series of study tours and fish farmer symposiums that involve selected fish farmers from neighboring IEHA countries. We will organize and carry out several training events in Uganda.

ANNUAL FISH FARMER SYMPOSIUM AND TRADE SHOW

The annual fish farmers' symposium and trade show has drawn participants from around the country and the region. The project will participate in organizing these symposiums by helping build the program and in some cases participating as speakers or resource persons. These events also provide a forum from which to disseminate the activities of the AquaFish CRSP. During the trials and particularly for the first cage harvested at each site, a site visit will be hosted by a fish farmers' group that will present their findings and experiences. The annual fish farmers symposium and trade show begun in Uganda in 2007 under the USAID funded Fisheries Investment for Sustainable Harvest (FISH) project. The project was small and operated in a focal pilot area of Central Uganda around Kampala operating in Iganga, Mukono, Wakiso Mpigi and Mityana Districts. Farmers and service providers around the country raised concern about the fact that they were unable to access information from the project, though the demonstration farms and training sessions on these farms were open to all.

Among their concerns, was while they could come to these sessions, the costs of travel several times a year for a specific topic was costly/not cost effective for them given their finances and impact on production when they were not on farm/the effect of them spending too much time away from their farms. They would rather a session was organised for them over a day or two where all information and finding for that year were communicated to them, questions asked. Holding a symposium seen to be the most viable option. Thus the first fish farmers' symposium where the first results of the FISH projects were disseminated to stakeholders in the fish farming across the country. The trade fair to demonstrate technologies and link farmers to suppliers of inputs for these technologies and sources of more information.

The level of interest was high from farmers and service providers. And at the evaluation of the first symposium it was observed that having more farmers from other parts of the country also present would enable direct discussion and answer questions. At second symposium WAFICOS offered to play a more active role realising the benefits and that one of their objectives was to disseminate quality and vetted technical advice to their members as many farmers were victim of poor advice. They realised it was a place for obtaining good advice, a farmer lead forum where farmers could openly air their views and concerns, and not a technocrat lead event where farmers are often relegated to being passive participants. At the second symposium, WAFICOS undertook to conduct these annually however, was limited in resources. However, they realised that there was more than meets the eye regarding the organisation of the symposia. (which the CRSP project covered)

Specifically, the purpose of the symposia and trade fairs are to:

1. To share farmers experiences in overcoming constraints in fish farming practice in the transition from subsistence to viable market oriented commercial enterprises.
2. To share the experiences of industry and other service providers of investing in and meeting the needs of a new emerging sector.
3. To exchange information on status and local innovations to overcome challenges faced by farmers and those involved in the aquaculture value-chain.

4. To promote collaboration among stakeholders in the aquaculture sector to enhance sustainable development.
 - I.

OBJECTIVES

1. Conduct an annual Farmer to Farmer study tour for producers from Kenya and Tanzania.
2. Organize Annual Fish Farmers' Symposium and Trade Show to disseminate project research results, provide reliable technical information, and share producer perspectives on fish farming industry trends and conditions.
 - II.

METHODS AND MATERIALS

Conduct Farmer to Farmer Study Tour for Producers from Kenya and Tanzania

The study tours organised for farmers from the neighbouring countries were linked to the Annual Fish Farmers Symposium and Trade fair as it was felt that the information and exchange of ideas with the wider sector of farmers/service providers at these venue would be beneficial to them. Thus, the study tours were organised for the day after the symposia and invitations sent out.

Organisation of the Fish Farmers Symposium and Trade Show

The farmers through WAFICOS took the lead role in the organisation of the event and identification of topics for the event. They solicited additional funding for the event, identified presenters, and approached participants for the trade fair. CRSP through the host PI and Aquaculture Management Consultants liaised with WAFIOCS to identify key areas, speaker's issues.

The support offered included reviewing and discussing topic lists and issues, identifying what sort of data would be required to bring out issues and illustrate key points the farmers wanted brought out or information on, collecting and analysing this/farmers' data as not all farmers were able to do this themselves, compiling presentations, verification of information and sources, compiling and editing symposium, records of attendance, preparation and multiplication of hand-outs during the symposia including proceedings of previous symposia., making of CDS, analysing evaluation data and making evaluation reports, loading the information onto the internet. Arranging the study tour and logistics for the study tours. WAFICOS members and other farmers were made open to Uganda farmers. The previous symposia did not have study tour attached. Advertising, Aquaculture Management Consultants Limited made the websites for the symposia both for the announcements and of the proceedings. Proceedings then given to agencies that supported, and other stakeholders that included the government institutions and private sector.

An optional one-day field tour to various aquaculture-related establishments was organized whose major objective was to expose farmers to successful aquaculture operations and establish contacts with input suppliers and vetted service providers (see Appendix 2).

Other Seminars and Tours

The outreach component collaborated with the other study teams of the Uganda project to organise seminars on specific aspects.

RESULTS

Conduct Farmer to Farmer Study Tour for Producers from Kenya and Tanzania

Farmers from Kenya were invited to the 2010 and 2011 annual symposia. The CRSP Kenya coordinator was instrumental in passing on the invitations. However, it was at the 2011 symposium that Kenyan farmers responded. Two attended and appreciated the benefits of the symposium and accompanying study

tour. On their return they passed word round and a special study tour was organised for a group of ten farmers and extension personnel.

The farmers were asked their interests and the tour was tailor made to their needs. A special hand-out was made of the places they were to visit by Aquaculture Management Consultants Limited. WAFCIOS collaborated by linking up with farmers and accompanying the farmers around (their program coordinator, Ben Kiddu).

Organisation of the Fish Farmers Symposium and Trade Show

The 2010 and 2011 symposia were undertaken with the support of CRSP. A combined total of about 300 participants attended and 34 presentations were made. Of these 4 of the presentations presented CRSP results and they were in line of the farmers' themes for that year. Most of the presentations were done by farmers regarding their experience.

The 2010 Symposium: The theme of the Third Annual Fish Farmers Symposium and Trade Fair in 2010 was “**Dealing with the Challenges of Building an Aquaculture Industry**”. This arose largely because during the year 2009, there were significant shortfalls in the supply of key inputs, notably feed and seed, yet farmers had increased their levels of investment into fish farming in view of the good performance they had obtained in 2007/08 with the formulated commercial feeds from Ugachick Poultry Breeders Limited and Source of Nile Limited and a general improvement in the quality of seed produced by local hatcheries. Levels of production and sales rose during that period.

Thus 2009 was a difficult year as it was too late for farmers to pull out considering the fish in stocked units and additional number of ponds that had been constructed. The only alternative was to make it work to salvage their investments as particularly the feed supply situation was temporal while Ugachick was upgrading its fish feed producing facilities to produce floating fish feed.

The focal points of discussion at this symposium were:

1. Assessing the key production factors affecting the viability of fish farming enterprises.
2. Identify and review challenges faced in accessing inputs and the implications on returns to investment and quality of service delivery.
3. Assess the availability of potential markets, and market information for fish farming.
4. Review the availability and quality of current support services to the aquaculture private-sector and factors affecting their accessibility.

Papers Presented at the 2010 Symposium: Table 1 lists the papers presented at the 2010 symposium. The key points for discussion were water supply for production, pond construction, feed and seed availability, accessing finance and grants. The symposium runs for two days

2010 Trade Fair: There were 12 exhibitors at the trade fair that run concurrently with the symposium for two days. The farms that displayed fish were members of WAFICOS. Fingerlings and table fish were displayed. The fingerlings were given as a door prize and table fish brought for display was sold to participants (see table 2). All the fish served at meal times during the symposium was farmed fish.

Table 1. Papers and presentations at the 2010 Symposium

Presentation	Name and Institution
First Session: Opening Remarks	
1. Welcome Remarks: A Brief About WAFICOS.	<i>P. Ssebinyansi</i> , Chairman WAFICOS
2. Opening Remarks:	<i>Hon. F. Mukisa</i> , Minister of State for Agriculture
3. Key Note Address: Aquaculture Technological Development - Developments and Challenges.	G. Atukunda, Head Aquaculture, NARO
4. General Discussion about Issues and Challenges Faced by Fish Farmers.	<i>Hon. F. Mukisa</i> , Minister of State for Agriculture and <i>J. J. Otim</i> , Presidential Advisor on Agriculture
Second Session: Key Production Factors Affecting the Viability of Farming Fish Commercially.	
5. Water Supply and Availability for Fish Farms.	<i>E. W. Tollner</i> , University of Georgia, USA/ AquaCRSP
6. Quality of Pond Construction and its Influence on Production and Returns: Recommendations and Farmers Experience.	<i>Peter Ssebinyansi</i> , Mpigi Fish Farm.
7. Low Survival Rates in Grow-Out Fish Ponds: Common Causes and Solutions.	Maurice Ssebisubi, Aquaculture Management Consultants, Ltd.
8. Technical Information Sources for Fish Farmers.	Gertrude Atukunda, Aquaculture Research and Development Center, Kajjansi (NAFIRRI-NARO.)
9. Production of High Quality Tilapia Fingerlings	Agnes Atuhaire, Source of Nile Fish Farm
10. Criteria and Best Management Practice Requirements for the Production of High Quality Catfish Fingerlings	Odhiambo Daniel, Kabeiura Fish Farm.
11. Dealing with the Challenges of Transforming from Subsistence to Commercial Fish Farming: Experiences from Eastern Uganda	A. Owor-Wadunde, Aquaculture Research and Development Center, Kajjansi (NAFIRRI-NARO)
12. Production of Nile Tilapia (<i>Oreochromis niloticus</i>) in Lake Cages.	<i>Abudala Napuru</i> , Source of Nile Fish Farm.
Third Session: Challenges Affecting Fish Farmers Access to Inputs and the Implications on Enterprise Viability and Quality of Service Delivery.	
13. The Challenges Faced in Investing in Commercial Fish Feed Production: A New Industry in Uganda and the Potential Benefits of Floating Fish Feeds for the Developing Aquaculture Sector	Karen. L. Veverica, Ugachick Poultry Breeders Ltd.
14. The Effect of Inadequate Seed Supply on Enterprise Viability: The Cost of ‘Come Tomorrow’	Kizito Ssentamu, Wakiso Fish Farm
15. Accessing Finance to Meet Operational Costs	Nafula Owor, 21ACC, Ltd.
16. Mechanisation: Adaptations for the Construction Commercial Fish Ponds	Ssimbwa M., AETREC, Namalere (NARO)
17. The Challenges of Restarting Aquaculture and the Potential for its Commercialization in Previous War Affected Areas of Northern and North East Uganda: Farmers’ Perspective	<i>John Walakira</i> , for Farmers, Northern Uganda

Fourth Session: Markets, Marketing and Market Information.	
18. Building Markets and Marketing of Farmed Table Fish: Successes and Challenges	Simon Owani, WAFICOS
19. Fish Safety - Quality Aspects	<i>Phillip Borel</i> , Greenfields (U) Ltd.
20. Regional Market Study for Farmed fish	Christopher Dhatemwa, UFPEA
21. The Benefits of Forming Cooperatives for Commercial Farmers	Bernard Tayebwa, Uganda Cooperative Alliance
22. Principles of Cooperation in Aquaculture	<i>Joseph Molnar</i> , Auburn University/ CRSP
23. WAFICOS Proposed Way Forward	Tom Musoke, WAFICOS
Fifth Session: Public Services to the Aquaculture Sector.	
24. USAID-LEAD Project – Objectives and Approach to Improving Livelihoods through Commercial Aquaculture	<i>Jacob Olwo</i> , USAID LEAD
25. WFP's Role in Uganda Aquaculture	<i>Pius Kwesiga</i> , World Food Programme
Closing Session.	
Wrap Up Open Discussion	<i>Professor J. J. Otim</i> , Presidential Advisor on Agriculture
Closing Remarks	
Door Prize	

Table 2: Exhibitors during the Jan 2010 Symposium.

Exhibitor	Products
1. Ugachick Poultry Breeders Limited	Floating fish feeds
2. Crest Tanks Ltd	Water tanks and holding facilities
3. Uganda Oxygen	Oxygen cylinders and refills
4. Pets Alley	Fish aquaria and filter systems
5. Aquaculture Management Consultants	Fish farming guides and advisory products
6. AETREC (NARO) Namalere	Walking tractor for compacting ponds
7. Edhron Enterprises	Catfish fillets, processing and packaging
8. WAFICOS	Live fish sales
9. NAFIRRI (NARO)	Research journals
10. SON Fish Farm	Fish feeds and fingerlings sale
11. Uganda Fish Net Manufacturers	Fish seine nets and cages
12. Ndejje Fish Farm	Live fish

The 2010 Study Tour

One tour was organised that attracted 59 Ugandan participants. The overall objective of the study tour was to expose participants to developments in the sector as well as allow interactive contact between input suppliers, farmers and service providers. The places visited were Tende Innovation Fish farm and Training Center (TIFTC), a catfish hatchery that also operates as a farmer sponsored-and-run farmer field school, Greenfields (U) Limited a fish processing plant that processes farmed fish for local consumption and regional export and Uganda Fish Net Manufacturers Limited that manufactures netting, pond seines and cages.

The 2011 Symposium and Trade Fair

In the year 2010 the key challenges that affected farmers were associated with the use of commercial feeds (including the new floating feed), its use and obtaining good returns. The price of feed had gone up due to a general increase in the cost of ingredients as well as due to the costs of feed manufacture. On the other hand, the price of fish had remained stable. Thus there was an obvious need in improving the efficiency of production as well as obtaining the best price possible of the farmed product and having quick sales.

Thus, the theme of the fourth 2011 symposium was ‘**Viable Fish Farming**’ and the following were the key issues discussed:

1. Production Planning and Management
2. Fish Feeds and Feeding.
3. Value Addition and Marketing of Farmed Fish.
4. Current Support Services to the Aquaculture Private-Sector.

III.

The 2011 Symposium: There were a total of 19 presentations under the above mentioned four specific objectives of this year’s symposium.

Table 3. Papers Presented at the 2011 Symposium

ID	Topic	Name of Presenter	Institution
SESSION ONE: OPENING			
1	Welcome Remarks	Paul Ssebinayansi	Chairman, WAFICOS
	Opening: Key Note Address	Mr. Jackson Wadanya	Assistant Commissioner of Fisheries, MAAIF
	General Discussion	Mr. Tom Musoke	Secretary, WAFICOS
SESSION TWO: PRODUCTION PLANNING AND MANAGMENT			
2	Key Issues for Aquaculture Feasibility Analysis and Business Planning in Uganda	Dr. Nelly Isyagi	Aquaculture Management Consultants, Ltd
3	The Potential of Fish Farming in Central Uganda	Dr. Theodora Hyuha	Makerere University
4	Projecting Input and Production Requirements: A Necessity for Successful Commercial Fish farming and Quality Service Delivery	Rita Amolo	Aquaculture Management Consultants, Ltd
5	The Practicalities of Mobilizing Resources to Establish a Commercial Group Owned Fish Farm; Implications on Returns and Viability.	Mr. Nyanzi Abdul	Farmer, Jinja
	General Discussion	Mr. Tom Musoke	Secretary, WAFICOS
SESSION THREE: FISH FEEDS AND FEEDING			
6	Factors Affecting the Performance of Commercial Floating Fish Feeds	Karen L Veverica	Ugachick Poultry Breeders Ltd. / Auburn University
7	Why does Fish Feed Cost so Much?	Karen L Veverica	Ugachick Poultry Breeders Ltd. / Auburn University
8	The Benefits and Risks of Making and Using On-Farm Fish Feeds – A Farmer’s Experience	Rhona Nabukeera	Sustainable Commercial Aquaculture for Poverty Alleviation (SCAPA) Project
9	Novus, Making a Difference in Nutrition	David Nyagaka	Novus International – Kenya Office.
10	The Performance of Ugachick Floating Fish Feeds: A Farmers Perspective	Daniel Ojiambo	Kabehura fish farm, Bushenyi
11	2010 Enterprise Budgets Catfish Grow-Out	Daniel Odhjambo	Kabehura fish farm, Bushenyi
12	2010 Enterprise Budgets Tilapia Grow-Out	Biira Yazeri	Kireka Fish Farm
13	2010 Enterprise Budgets Tilapia Nursery	Kiddu Ben	WAFICOS
	General Discussion	Mr. Tom Musoke	Secretary, WAFICOS
SESSION FOUR: VALUE ADDITION AND MARKETING OF FARMED FISH			
14	Creative Marketing	Tom Musoke	Kabaganda Fish Farm
15	Value-Addition, Preservation and Marketing	Dr. Margaret Maseette	FBRC-Kawanda

ID	Topic	Name of Presenter	Institution
	Discussion: Times when I Sold at a Profit and at a Loss.	Mrs. Mary Zaramba	Fish Farmer, WAFICOS
SESSION FIVE: SERVICES TO THE SECTOR			
16	Financing Aquaculture	Ms. Sabano Mwaka Ann Marie.	Agricultural Credit Officer, Centenary Bank.
17	Helping Build Aquaculture Enterprises, Success and Challenges	Jacob Olwoo	USAID LEAD
18	Deep Blue Aquatic Systems	Brynn Simpson	Deep Blue Aquatic Systems, South Africa
19	Certification for Aquaculture Professionals	Karen Veverica,	Auburn University, USA.
20	EU Study on Promoting Commercial Aquaculture in Uganda	Malcolm Dickson.	EU Mission/COWI
	General Discussion	Mr. Tom Musoke	Secretary, WAFICOS
SESSION SIX: CLOSING			
	Question Answer Time and Wrap-up Discussions	Mr. Tom Musoke	Secretary, WAFICOS
	Prize Draws	Mr. Paul Ssebinaynsi and Mr. David Tilia	Chairman WAFICOS and Principal Fisheries Officer, MAAIF
	Closing Remarks	Mr. David Tilia	Principal Fisheries Officer, MAAIF

Among the participants were two Kenyans and the EU Mission undertaking a study on ‘Promoting Commercial Aquaculture in Uganda’. The study was specifically scheduled so that the mission could attend the symposium and obtain up-date information on Ugandan aquaculture from farmers and other key stakeholders.

The 2011 Trade Fair

There were 11 exhibitors at the trade (see table 4). There was a strong emphasis on the marketing of farmed fish this year. The table fish and fish-products brought to the fair were all sold to participants and people from around the UMA show grounds who came to have a look at what was on display. All the fish and fish products served at this year’s symposium (both tilapia and catfish) were from WAFICOS farmed fish. One of the exhibitors, Deep Blue Aquatic Systems came in from South Africa.

Table 4: List of Exhibitors

Exhibitor	Products
1. Ugachick Poultry Breeders Limited	Fish feeds and feeding guides.
2. Green Fields Uganda Limited	Fish fingers and fish burgers
3. SON- Source of the Nile fish farm	Whole fresh tilapia on ice.
4. WAFICOS	Live table size catfish and tilapia. Smoked whole catfish.
5. Aquaculture Management Consultants	Aquaculture equipment and aquaria
6. Deep Blue Aquatic Systems (in collaboration with Aquaculture Management Consultants)	Aquaculture and live fish holding systems
7. Sun Fish Farm	Live fish haulage truck
8. Nile Crocodile Park.	Books. The Best Options for Africa
9. National Fisheries Resources Institute	Research papers/journals
10. Tende Innovation Fish Farm and Training Center	Live catfish fingerlings.
11. Uganda Fish Net Manufacturers	Fish seine nets, predator nets and cages

The 2011 Study Tour

The farmers study tour in 2011 was expanded. In the previous year (2010) participants of the tour noted that there was a lot to learn from the sites visited and it was not worth it for them to visit several sites like ‘tourists’ in a day. Thus the objectives of the 2011 were not just to show-case but demonstrate best practices that participants could pick up for adoption. The demonstrations were undertaken by farmers themselves with the assistance of technical personnel from WAFICOS and Aquaculture Management Consultants limited. Training hand-outs were prepared for distribution by Aquaculture Management Consultants Limited.

The sites visited were:

1. *Route 1: Kabaganda Fish Farm and Ugachick Poultry Breeders Limited* that demonstrated tilapia nursery management, commercial fish feed production and the processing of catfish fillets.
2. *Route 2: ARDC – Aquaculture Research and Development Center (ARDC) Kajjansi and Pearl Fishing and Aquaculture Limited.* This tour showcased the new research facilities at the Aquaculture Research and Development Center and demonstrated feed-based tilapia and catfish pond grow-out management.
3. *Route 3: Living Waters Fish Farm and Kireka Fish Farm.* This tour demonstrated feed-based tilapia and catfish pond grow-out management, siting and setting-out of new ponds, use of the commercial pond seine and catfish hatchery management.

As a sequel attendance of the Kenyan farmers to the 2011 symposium was a study tour organised for a group of Kenyan fish farmers and extension agents. Table 5 gives an overview of the places visited.

Table 5. Study Tour for Kenyan Farmers

Day	Venue	Type of Farm
One	<ul style="list-style-type: none"> • Arrival in Kampala 	
Two	<ul style="list-style-type: none"> • Source of Nile Farm, Buikwe • Living Waters, Mukon • Kireka Fish Farm, Wakiso 	<ul style="list-style-type: none"> • Tilapia hatchery and cage culture. • Catfish and Tilapia grow-out. • Smallholder catfish hatchery.
Three	<ul style="list-style-type: none"> • Kabaganda Fish Farm, Wakiso • Ugachick Poultry Breeders Limited, Wakiso • Travel to Bushenyi 	<ul style="list-style-type: none"> • Tilapia Nursery • Fish Feed Factory.
Four	<ul style="list-style-type: none"> • Kabeiura Fish Farm and fish farmer out-growers , Bushenyi 	<ul style="list-style-type: none"> • Catfish hatchery • Tilapia and Catfish grow-out
Five	<ul style="list-style-type: none"> • Travel Back to Kampala • Mpigi Fish Farm, Mpigi 	<ul style="list-style-type: none"> • Tilapia Nursery
Six	<ul style="list-style-type: none"> • Return to Nairobi 	

Other Seminars and Tours

The outreach component participated in coordinating, offering technical support, preparation of training material and compiling documentation for the seminars and field visits:

1. Review of the questionnaire for the marketing study.
2. Seminar by Tollner at MUK and Kabanyolo.
3. Field visits of Hydrology MUK to potential study sites in Gulu, Wakiso, Mityana, Mukono and Buikwe.
4. Sourcing of cages, fingerlings, stocking and sampling of CRSP trial cages.

IV.

CONCLUSION

Participants considered the symposia and study tours a general success. The key factors that were used to define success were the relevance of the presentations and demonstrations to the prevailing challenges that farmers and other stakeholder in the sector were facing. The effectiveness of farmer-to-farmer dissemination was fully realised as most of the presentation were by farmers, the discussions during the plenary session were led by the farmers themselves and the key facilitators on farms during the study tours, were the farmers themselves. The technical personnel only came in to supplement and explain the principals upon which the technologies were based and issues that affected their application on-farms.

The role and capability of the private sector where appropriately supported in dissemination of technical information and training is also illustrated. WAFICOS, as producers and aquaculture service providers are the aquaculture private-sector. Participants paid attendance to the symposia and trade fair as did exhibitors. Likewise is the level of support the program has received from Aquaculture Management Consultants Limited. This shows that where quality services are provided that are result oriented, farmers and other service providers in the private sector can support these initiatives to make them sustainable.

The outreach program has been able to disseminate information to stakeholders directly. Proceedings have been disseminated via CD to all attendees of the symposia as well as personnel in key government offices notably the Ministry of Agriculture, Ministry of Finance Economic Planning and Development, the National Agriculture Research Organisation (head office and its centres involved in aquaculture), Makerere University, Fisheries Training Institute, District Fisheries Officers, FAO, USAID LEAD, Banks, etc. Proceedings of the symposia have also been disseminated via the internet to the wider African and international community via the SARNISSA website that is a widely consulted aquaculture interactive site in Africa.

The outreach strategy adopted can be considered a success. Dissemination can be undertaken through direct contact training seminars between CRSP personnel and farmers, farmer-to-farmer and via media-based PC tools.

The project anticipated that major benefits of the project would be:

1. Information and improved production for individual farmers and rural communities.
2. Increase in the membership of fish farmer groups as a result of the symposia.
3. Service providers and suppliers of inputs gaining recognition and possibly clients.

The benefits that actually accrued based on the response of WAFICOS members (Quote):

1. It has become a forum where farmers and others involved in the industry discuss up-to-date issues affecting them. The factors that influence performance are dynamic. If one is to stay in business, then problems have to be solved along the way and opportunities identified early and are taken advantage of. The papers presented and study tours focus at key issues that arose the previous year. Hence, farmers and service providers mention this as among the key benefits of the symposium
2. WAFICOS membership has increased. So has the credibility of the association. Agencies notably NGO's and NAADS (National agricultural advisory services) now cross-check with WAFICOS when vetting tenders (hatcheries) to supply fingerlings asking the association to verify whether the farm exists and what sort of fingerling quality the farms tend to produce.
3. WAFICOS now asked officially by training institutions (Fisheries Training Institute and Makerere University) for placement of interns.
4. The farms and other establishments visited during the study tours have registered increased sales. Such farms also have more visitors and training institutions seek to attach interns or conduct study tours on these establishments.
5. More farmers demanding for services from WAFICOS which include information, technical services and inputs. Among the key success is WAFICOS office becoming an official outlet for Ugachick feed whereby farmers can buy the feed at wholesale price. This has enabled farmers identify loopholes and opportunities beyond the farm level. Several farmers have taken advantage of this and have established businesses (i.e. marketing, inputs) and are negotiating getting better prices for their fish.
6. WAFICOS ties with other institutions, (Government, donor, NGO's, training institutions) have been strengthened. The relationship is increasingly becoming two way as they realize that WAFICOS has useful information to give that they would otherwise have no access to, thus has a contribution to the sector. The relationship less of one where they look as the association as a 'beggar' that can only survive on their handouts.
7. WAFICOS and other farmers have learnt more about what other farmers are doing from the symposium.
8. Farmers have learnt new technologies and their application through the symposia and study tours. Adoption rates of appropriate technologies has consequently increased (e.g. use of feed, pond construction techniques) as has been observed when WAFICOS technical staff visit farm or when farmers come to the WAFICOS office to register and seek services. Farmers also now appreciate why certain things are the way they are because during the symposia different stakeholders' discuss the issues affecting them not just services offered. The discussions get to the heart of the matter. Hence, there are more farmers who visit the WAFICOS who now realize the onus is on them to make their farms viable by adopting best techniques, improving efficiency of production rather than waiting for government/donor grants, asking for loans or complaining about feed prices being too high. They understand why things are the way they e.g. costs of ingredients, what is involved in getting loans and

that one should only think once the business proves itself profitably and running. In essence, those who have attended the symposia are becoming aquaculture business men and women.

9. WAFICOS is now known country-wide and membership has increased beyond the original stipulated geographical region of Mpigi, Wakiso, and Kampala. Membership is now country-wide and services delivered to members where-ever they are. Farmers pay for transport and are willing to do so because of the reliability and quality of services offered.

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