



SARNISSA AQUACULTURE POLICY BRIEF #1



Key policy messages

- When defining aquaculture policies it is crucial to recognize that specific aquaculture systems contribute differently to achieving various policy objectives and greatly differ in their development constraints and support needs.
- Aquaculture policies and programmes should be better targeted (for example, in the selection of target areas and fish producers) and measurable results indicators should be specified.
- Aquaculture policies need to specify the annual budgets available to achieve the proposed deliverables of the policy plan, matched against specific activities with specific outcomes.
- Aquaculture research should be more focused on providing practical solutions for sustainable aquaculture development, especially, improved productivity and profitability. This requires more on-farm research and better interaction between researchers and fish producers.
- Training and education need to be better oriented towards the different needs of end-users in the various aquaculture systems; producer organizations, NGOs and educational centres should play a stronger role in implementation. More use should be made of the Internet and other new media.
- Clarification, simplification and enhanced ease of access to legislation and related procedures will encourage investment by private actors. Preparation of guidelines and quality standards governing the operations of specific aquaculture production systems is recommended.

FOOD FOR THOUGHT

Towards better focused and more effective aquaculture policies

Aquaculture in sub-Saharan Africa (SSA) has good potential due to increasing demand for fish and other aquatic products, the decline in marine and freshwater fisheries, favourable natural conditions for aquaculture and the availability of relatively low-priced land and labour. The development of aquaculture in Africa has received much policy and donor attention over the past 30 years, but, generally, the results have been disappointing.

SARNISSA (Sustainable Aquaculture Research Networks In sub-Saharan Africa), an EC-funded project, implemented analytical reviews of national aquaculture policies and programmes of ten countries (Malawi, South Africa, Zambia, Madagascar, Uganda, Kenya, Cameroon, DR Congo, Ghana and Ivory Coast) in order to understand why the development of aquaculture remained below expectation and to identify opportunities for improvement (reports available at: www.sarnissa.org).

The results of the SARNISSA studies are summarized in two Policy Briefs that provide evidence-based recommendations for governments and other stakeholders to ensure that aquaculture fulfils its potential in SSA.



Integrated rice-fish farming, APDRA, Guinea

The main aquaculture production systems differ strongly in their results, constraints and support needs

Three main aquaculture systems can be distinguished in SSA that differ significantly in their management logic as well as their resource use:

a. Small-scale aquaculture as a component of rural farm systems

This system is linked to agriculture/livestock; mainly use of on-farm resources; only supplementary use of artificial feed; mainly extensive fish production for self-consumption and, occasionally, local markets. Main benefits of this type of aquaculture include increased diversity, resilience and output of the total farm system (and thus higher income) and enhanced local food security and nutrition.

b. Small- and medium-scale (semi-)intensive aquaculture (SMEs)

entrepreneurs that are specialized in producing fish and other aquatic products for local and urban markets; mainly semi-intensive/small-scale and some intensive/medium-scale production. They invest their own and loaned resources, mainly apply family and, sometimes, additional labour and make use of purchased inputs. Main benefits of this type of aquaculture include local enterprise development, employment and income generation, enhanced availability of fish at local and urban markets.

c. Large-scale industrial aquaculture: industrial production; often vertical integration of fingerling and fish feed production, ongrowing, processing and marketing; hired technical management and

labour; mainly foreign capital; producing for export but increasingly also supplying national markets. Main benefits: industrial development and generation of foreign revenues; sometimes also: employment generation, supply of fish products to urban markets or supply of fingerlings to smaller-scale producers.

Each of these main production systems yield specific benefits (and thus contribute differently to various policy goals), whilst having specific limitations and encountering specific development constraints.

Clarification of objectives and expected results

The aquaculture policies, strategic plans and programmes of the 10 SSA countries that were reviewed by SARNISSA rarely describe the intended impacts clearly. Objectives should be clearly formulated, specifying the expected results and related measurable indicators for each objective. This would better focus these programmes and would enable selection of the most appropriate aquaculture system(s) for support and the best strategies to achieve the objectives.

Better selection of intervention strategies and beneficiaries

Most policy documents and strategic plans include a general list of problems and actions that should be implemented but rarely take into account that each of the main aquaculture production systems have specific potentials, encounter specific problems and differ in their support needs.



SME aquaculture, Ibadan, Nigeria



Course on fish dissection, South Africa



Development of each of the main production systems requires a specific approach and support package.

Accordingly, it is highly recommended that intervention strategies are based on an adequate analysis of the potentials and problems of each of the main production systems (see SARNISSA Policy Brief # 2).

Better selection of aquaculture producers and stronger focus on geographic zones and associated markets with high potential for certain production systems, as has been done in Nigeria, will also lead to more effective policies and programmes. For (semi-) intensive aquaculture producers, for example, the distance to urban markets is an important factor, especially where road infrastructure is poor, and location in peri-urban areas is often most appropriate.

Concentration of development support for aquaculture on clusters of fish producers will facilitate exchange and cooperation among fish farmers and other stakeholders (value chain development). Inclusion of aquaculture in the local/regional development plans of the prioritized zones is recommended.

Stronger involvement of the targeted beneficiaries in the design and implementation of aquaculture development is needed, since this will not only improve the quality of the design of projects and aquaculture enterprises, but will also enhance the level of commitment, increase the beneficiaries' own contributions and improve their skills in decision making and management, which are crucial factors for the sustainability of aquaculture farms.

Clear and enabling legislative frameworks

Unclear or complicated legislation is widely reported as an important constraint for the development of aquaculture; specifically, legislation related to land and water rights, and environmental legislation. In many cases, only farmers with access to their own sources of water can farm fish, as the rights to use communal and public water are unclear or limited. In several countries this has led to community conflicts over resources used in fish farming. Complicated and extensive environmental legislation and lengthy and costly procedures often discourage investors. Clarification, simplification and ease of access to the legislation required to start fish farming encourages investment. Also, preparation of guidelines and quality standards, including health and sanitation issues, governing the operations of specific aquaculture production systems will have positive effects (the Malawi Gold Standard, focusing on small-scale, market-oriented fish farming, is an example).

Clarification of financing mechanisms and priorities

The aquaculture policy documents and strategic plans reviewed by SARNISSA rarely, if ever, defined the financial requirements and the sources of finance to be used to implement the proposed interventions, often with the activities included being far too ambitious and having no relevance to realistic budgets. Clarification of sources of finance and their mix (governmental, private sector investment, donor funding, other sources) and linking budgets to specific activities and



The future Kamiti Integrated fish farm, Kenya

deliverables will lead to better results. Funding should be based on principles of sustainability and financial viability (through cost benefit analysis) of specific production systems, whilst programmes introducing technologies with the help of heavily, temporarily subsidized inputs should be avoided.

Clarification of the roles of the State and other actors in aquaculture development

Aquaculture policies and strategic plans are often poorly implemented. Next to financial issues this is also due to “top-down” administrative systems, the lack of involvement and clear agreements on the roles and contributions of the various actors in the implementation of policies and poor coordination and monitoring systems. In most cases, the direct stakeholders do not participate in the planning of activities that aim to support them, resulting in projects that do not effectively respond to their needs.

Until recently, government fisheries departments were seen as the main implementers of aquaculture policy and the main source of knowledge and funding, with little attention to the roles of private enterprises, fish farmers' associations, NGOs and other stakeholders. Currently, there is growing consensus among aquaculture planners that such a view requires adaptation given the actual limitations in government resources (funds and expertise) and the growing number of private initiatives in aquaculture that are developing with minimal or no government support.

The SARNISSA country reviews indicate that most aquaculture planners in SSA now agree that the primary role of governments in aquaculture development is to create a conducive environment by establishing adequate legal frameworks, effective mechanisms for inter-institutional and public-private cooperation, stimulating private investment in aquaculture, facilitating the access of small- and medium-scale aquaculture enterprises to credit institutions, and enabling educational institutes and farmer organizations to take on roles in the provision of training and extension services to their members.

Adequately administering, monitoring and regulating aquaculture is another crucial role of governments. For example, Ghana has installed a quality control system, which includes licensing and environmental monitoring and support to the newly launched Ghana Aquaculture Association.

Consensus is growing that aquaculture production, processing and marketing, as well as production and supply of fish seed and feed are best left to private actors. However, the establishment of private hatcheries and feed factories needs active support of the government (by facilitating access to land, electricity, credit facilities, etc., as was achieved in Egypt, which is now by far the largest aquaculture producer in Africa).

Multi-stakeholder partnerships

The establishment of national and regional networks or platforms involving various stakeholders in aquaculture has yielded positive results (for example, in Madagascar, Uganda, Ghana) and has facilitated the development of structured partnerships between government



Fish production in Kakamega, Kenya





fisheries departments, research institutes, organizations of small- and medium-scale fish producers, larger enterprises, credit institutions, NGOs, and other stakeholders. Doing so not only enhances the commitment of these stakeholders to the new policies and generates their own contributions to the implementation of these policies, but also results in more effective strategies that are better adapted to the prioritized needs and working conditions of the various types of fish farmers and other actors in the market chains.

More on-farm and participatory research

In most SSA countries it has been the role of government and university research stations to generate new aquaculture technologies for the benefit of end users. However, for many reasons, these research stations have struggled to achieve this and the results to date have been limited. One of the most important factors has been that their research trials have rarely been carried out under the actual, on-farm conditions in which the intended end-users operate. The resulting technologies are therefore often not well adapted to the local context (technical, socio-economic, commercial), nor are they based on financial viability analysis. Thus, more collaboration should be encouraged between researchers and the producers and their associations to set up more on-farm research trials to identify practical solutions for specific problems in the existing aquaculture systems and to adapt an innovative model or technology to the specific conditions and priorities of the targeted producers (which enhances their adoption and sustainability). Projects applying participatory and field based approaches, such as in Cameroon, Ivory Coast, Kenya and Zambia had substantially better

outcomes compared with conventional approaches and results were more sustainable as farmers learned to innovate and adapt their production methods to changing conditions and market demands.

Fisheries departments should encourage their staff to develop their knowledge on action-research and earmark part of their budget for on-farm research; researchers that produce positive results could be awarded incentives in terms of larger funding allocations in future. Action research should also be systematically included as a component in all (larger) aquaculture development projects. Additional costs of such a component will be small, while it will substantially raise the relevancy and impacts of the project. In order to reduce the dependency of aquaculture research on government funding, the involvement of local universities, private commercial enterprises, NGOs and farmer organizations in the implementation of adaptive on-farm trials should be encouraged. National aquaculture research institutes can provide expert guidance to these actors and promote sharing of results at local, national and regional levels.

Researchers should better clarify and justify the policy relevance of aquaculture research projects by clearly presenting the expected impacts of their research in terms of improved productivity and economic benefits of fish farms, higher incomes, job creation, increased availability of fish in the market, reduced environmental impacts of fish farms, increased resilience of farms that integrate their other farming with a fish pond, or other policy goals. Research results should be presented concisely and in a style of writing that is equally accessible to both decision makers and fish farmers.



Catfish hatchery, Ghana

Aquaculture education and training should be more practical and needs-based

Many educational centres providing aquaculture training still tend to offer theory-based education that is detached from practice. Little attention is given to enhancing the capacities of students, government staff or others to manage commercial hatcheries or start their own aquaculture businesses. Aquaculture education and training needs to be better tailored to the requirements of the job marketplace, as well as to the needs and realities of aquaculture. Trainees must be actively involved in actual aquaculture production and market chain processes through internships on aquaculture farms and hatcheries of different types and scales. Their practical knowledge of participatory research and extension approaches should also be enhanced.

Alongside specialized aquaculture programmes, universities and training institutes should also offer more in-service training for government staff, including aquaculture extension workers and research farm technicians, as well as short courses for small-scale fish producers, operators, investors and would-be investors (including aquaculture business planning and management alongside a wide range of technical skills).

A number of countries are successfully experimenting with new approaches to aquaculture development. These involve NGOs, private service providers and/or producer associations in the provision of training and technical assistance to fish producers as well as the implementation of local participatory

adaptive trials. In some cases, the management of local field stations and demonstration farms have been transferred to local producer associations or NGOs, subsidizing their functioning as a local “technology transfer centre” and/or contracting these organizations to supply extension services to certain target groups in a specific geographic area. In other cases, governments successfully promote the provision of training and extension services by private enterprises (such as input suppliers) as an integrated component of their commercial activities. For example, in western Kenya, a network of commercial “Aqua-shops”, selling aquaculture supplies (equipment, feed, pharmaceuticals) and providing information (such as manuals and market information) to local fish farmers, is being established in close cooperation with local entrepreneurs and producer organizations (see <http://www.farmafrica.org.uk/cms.php?page=133>).

Use of new information media; better targeting and packaging of information materials

In order not to depend only on expensive face-to-face training and extension, better use can be made of new communication technologies. The establishment of a National Aquaculture Information Centre, managed by experienced aquaculture and IT personnel, is recommended. This Centre would make information on actual policies and regulations, technical manuals, training materials, research reports and investor guidelines, accessible in hard-copy and also by Internet terminals for use by individual users and at technology transfer centres in different parts of country. Access to aquaculture information can be enhanced by facilitating access of producer



Extensive farming, Ethiopia



associations to the Internet. Mobile phones can be used to make market information available to fish producers and traders and allow fish farmers to maintain contact with suppliers, traders and researchers.

The preparation of information and training materials should be better targeted and packaged for specific types of fish producers, their specific information requirements and communication patterns. The organization of "write-shops" with a group of selected researchers, practitioners and communication specialists has produced good results in generating such materials.

Gender issues to be taken into account

The SARNISSA studies reveal that the actual policies and programmes hardly pay any attention to gender issues. Although women are involved in all sorts of ways in aquaculture across the continent, women's contribution to aquaculture is often unrecognized and little research has gone into the question of how aquaculture affects the status of women and gender relations in the household and community, and how, in turn, these relationships influence the effectiveness of aquaculture in improving livelihoods and local economic development.

It is important that the formulation of aquaculture policies and strategies is based on an objective assessment of gender issues in aquaculture and the specific constraints encountered by women (for example, access to resources), in order to make aquaculture policies and programmes more gender responsive to the practical and strategic needs of women. The framework developed by the Gender in Aquaculture project is, after adaptation to the specific local context, an

important tool for such assessments, and for gender-sensitive policy formulation.
([http:// www.dfid.stir.ac.uk/dfid/gender](http://www.dfid.stir.ac.uk/dfid/gender))

Better monitoring of results; identification of success factors

Since most policy documents and strategic plans for the aquaculture sector do not specify their objectives, it is not surprising that clear impact indicators are also generally lacking, hindering monitoring of the effectiveness of the policy. Published statistics are often inaccurate (and/or inflated). The establishment of adequate monitoring systems with well defined results indicators and clear baselines is crucially important. Goal setting should be realistic and evidence based. Aquaculture strategy plans should be considered as "rolling agendas" that are periodically updated on the basis of the insights gained from monitoring.

In some countries, for example, Kenya and Uganda, the government fisheries departments have begun to develop a registration system of all fish farmers that are actually producing fish and other products on a regular basis, including their GPS co-ordinates, which will be a useful tool in selection of the right location for potential new entrants as well as for research and development projects (cluster approach) and the monitoring of the results of such projects (see <http://www.fao.org/fishery/naso-maps>). In order to address the continual problem of inaccurate statistics, the Fisheries Department of Ghana and the University of Ghana recently set up a training course on fisheries and aquaculture statistics and data collection.



When carrying live fingerlings in head pans to stock into cages, Ghana

The monitoring of aquaculture research, training and extension activities should not be restricted to assessing the number of beneficiaries and effects of the activities on the knowledge and skills of the participants, but should also take a mid- to longer-term approach, measuring the impacts on the productivity and financial viability of the farms and on the improved functioning of the market chain after the project has ended.



Sustainable Aquaculture Research Networks in sub-Saharan Africa

This is the first of two Policy Briefs on Aquaculture prepared by SARNISSA, an EC funded collaborative research project of European organizations and partners in sub-Saharan Africa. The two Policy Briefs summarize results from SARNISSA studies and provide evidence-based recommendations for governments and others to ensure aquaculture fulfils its potential in SSA.

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