

Challenging the productivist paradigm: A food sovereignty and nutrition-sensitive approach to tilapia aquaculture in sub-Saharan Africa

Alexander M. Kaminski

Introduction

The “lack-of-feed-and-seed” narrative is used time and time again to explain why small-scale farmers in Africa fail to adopt aquaculture successfully. Tilapia farmers that are not productive are relegated to the bottom of a production hierarchy based on narrow and often imprecise productivity statistics as indicators of their value chain membership and, indirectly, their success as fish farmers. However, do farmers have enough autonomy to make the right decisions in the value chain and what do we mean by success?

What is a the productivist paradigm?

- Productivism is the belief that measurable productivity and growth are central to the development of aquaculture and that “more production or better productivity” is the primary goal of food production systems.
- In tilapia farming in sub-Saharan Africa this usually results in an overfocus on formulated feeds, genetical improved and fast-growing fish strains, or other methods that try to improve productivity.
- Usually, assessments either blame a lack of these inputs and services as the reason why small-scale aquaculture does not grow, though little work is done to alter the production system entirely.

What does food sovereignty mean?

- The right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems.
- In aquaculture terms this means not relying on or competing with large-scale commercial agri-food regimes and moving away from commercial feeds, finding alternative sustainable solutions to pond inputs, and growing an integrated food system where fish and other foods are grown to maximise human wellbeing.

What is nutrition-sensitive aquaculture?

- Aquaculture that places the food and nutrition security of people as the primary goal of the food system and which influence underlying determinants of basic nutrition adequacy.

Methods

This poster acts as a summary of a PhD thesis recently submitted by AM Kaminski to the Institute of Aquaculture at the University of Stirling. There are four specific chapters that detail case studies of nutrition-sensitive approaches to aquaculture in Zambia and Kenya. Some pictures can be seen below. Publications under review or in prep.



Results

Table 1: Summary of alternative production systems that are more applicable to small-scale farming characteristics in Africa and help achieve food sovereignty

Alternative production system	Description	How the system complements smallholder farming characteristics and leads to greater food sovereignty
Natural Feed-based Regimes	Using natural, locally produced foods and fertilizers that promote phytoplankton-based growth) and/or using natural waste from the farm	<ul style="list-style-type: none"> • Uses the availability of on-farm resources or closely available natural products that already exist in the area • More adaptable to local livelihood context • No necessity for formulated feeds and feed mills • More ecosystem friendly • Lower input costs
Integrated aquaculture and agriculture	Establishing systems that promote the integration of aquatic and terrestrial farming activities (e.g., growing tomatoes on pond dykes) and allowing farmers to better manage their time and labor for producing many different foods	<ul style="list-style-type: none"> • Mixing different livelihoods already managed by farmers (or introducing new diverse, nutrient-rich foods). • More beneficial for division of labor in household • More efficient water-use and farm management • More adaptable to local livelihood context • Managing labor and time better • Increased production and dietary diversity for food and nutrition security
Polyculture systems	Mixed fish systems that improve yields and sustainability, producing small, self-recruiting, nutrient-rich fish for consumption and for market - includes carnivorous species that control recruitment of fast breeding species, or the use of different aquatic organisms to reduce waste, provide ecosystem services, and improve efficiency	<ul style="list-style-type: none"> • Producing more diverse fish that people prefer • Overcomes restrictiveness of monoculture systems by relying on different fish species • Promotes intermittent harvesting of non-commercial species • Overcomes lack of seed issue if species are self-recruiting (though more commercial polyculture systems can exacerbate seed issues) • Gives farmer a diversity of products and choices • Promotes better health outcomes as smaller, nutrient-rich fish can be stocked and consumed
Mixed-sex tilapia systems	Stocking mixed-sex fingerlings and allowing them to breed. Whilst this is already largely practiced, better management of such systems is needed	<ul style="list-style-type: none"> • Can intermittently harvest throughout cycle • Can use already existing, localized seed networks • No need for sex-reversible hormones • Producing larger biomass of fish of different market sizes • Support autonomy of juvenile supply - no requirement for constant re-stocking of seed
Targeted small tilapia production	Purposively growing tilapia to a smaller size that fits current market and consumer demand. Fish are grown for shorter periods under increased stocking densities	<ul style="list-style-type: none"> • Applicable for ponds and cage farming • Targeting fish products that are generally affordable by low-to-middle-income consumers • Growing fish for shorter more manageable cycles (can be adopted by larger commercial farms too) • More cash flow and lower FCR • Tapping into local, rural markets
Household and gender transformative approaches to farming systems	Establishing equitable and complementary roles for household members involved in fish farming, especially those that aim to challenge the inequalities faced by women	<ul style="list-style-type: none"> • Adapting already existing gendered division of labor to establish better aquaculture management regimes • Better use of time and labor • Makes participation in aquaculture more equitable and inclusive • Improves household-decision making, responsibility-sharing and overall productivity
Decentralized hatchery operators	Rural farmers actively breed fish to produce fingerlings for sale in simple hapa-based or pond-based systems, for direct sale in localized communities, i.e., farmers produce their own seed	<ul style="list-style-type: none"> • Farmers already engage in complex seed networks in rural areas • Allows farmers to order and purchase seed when their season begins • Gives farmers another income source • Overcomes issue of seed supply and reliance on government hatcheries • Can ensure better quality fingerlings that are less stressed • Localized production systems that service rural communities

Photo credit [top]: Jason Mulikita, Jacob Johnson, [bottom] Alexander Kaminski