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Enhancing sustainability in African catfish

seed supply for improved production in Kenya

KEY MESSAGES

African catfish *Clarias gariepinus* is a good food fish

Farmed production of catfishes in Kenya is low

Main reason is low survival of fry (larvae) which reduces seed availability

Farmers therefore forced to look for catfish seeds from natural sources

This is environmentally unfriendly, increases exploitation pressure on natural populations of Catfish, exposes fishermen to health risks and constitutes loss of income for farmers

Careful choice of catfish brood stock and management of the stock by nuclei hatcheries, combined with improved husbandry is a sustainable strategy to increase survival of fry and seed availability for farmers.





1. A mature African catfish, *Clarias gariepinus*, from a farm in Kenya.



2. Catfish juveniles which could be used as seed material by farmers



3. Fishermen scouring dense water hyacinth mats in Lake Victoria in search of catfish seeds for use in stocking ponds and as live bait to catch Nile perch in the Lake.

INTRODUCTION

African catfish, *Clarias gariepinus*, is an important farmed species in Kenya, where it provides food, as well as live bait for catching Nile perch in Lake Victoria, using long line hooks, therefore it increases food and nutrition security, income and national development in Kenya. However, annual average production of catfish from fish farms is low. This is mainly because of inadequate supply of quality seeds for use by farmers to stock their ponds¹. Limited availability and supply of farm-raised catfish seeds is due to poor survival of catfish fry², mainly due to use of poor quality brood stock of unknown ancestry³, exacerbated by poor husbandry practices by farmers^{4,5}. Therefore, the supply of catfish fry to fishermen in Lake Victoria to use as live bait for Nile perch is also limited. As a result, fish farmers and bait traders collect catfish seeds from natural habitats. Similarly, hatchery operators also collect catfish brood stock from natural habitats for use in artificial propagation for seed supply. This practice is unsustainable since it is environmentally unfriendly, increases exploitation pressure on natural populations of catfish, and exposes fishermen collecting catfish seeds from the natural habitats to health risks.

Additionally, the quality of catfishes collected from the natural habitats is not assured, requisite numbers are not met in a reasonable time, and the practice constitutes loss of income by catfish hatchery operators and farmers as well. Artificial propagation of catfish at hatcheries is a sustainable way of reducing exploitation pressure on natural populations of indigenous fish species of Lake Victoria basin⁶. It also generates income and livelihoods for farmers^{7,5} as well as guarantees quality and adequate numbers of seeds. Identification and isolation of high quality catfish brood stock for use at hatcheries in artificial propagation in combination with improved husbandry for resultant fry could be a suitable strategy to increase availability of farm-raised catfish seeds to support expanded aquaculture in Kenya. In order to maintain the quality of such brood stock, nuclei hatcheries should be developed, to manage this stock. Such hatcheries will be charged with artificial propagation of catfish larvae for sale to farmers, who should consistently maintain best management practices on their farms.

WHAT IS THE PROBLEM?

High mortality of catfish fry at hatcheries is common, with farmers losing up to 99.8% of the seed material⁸

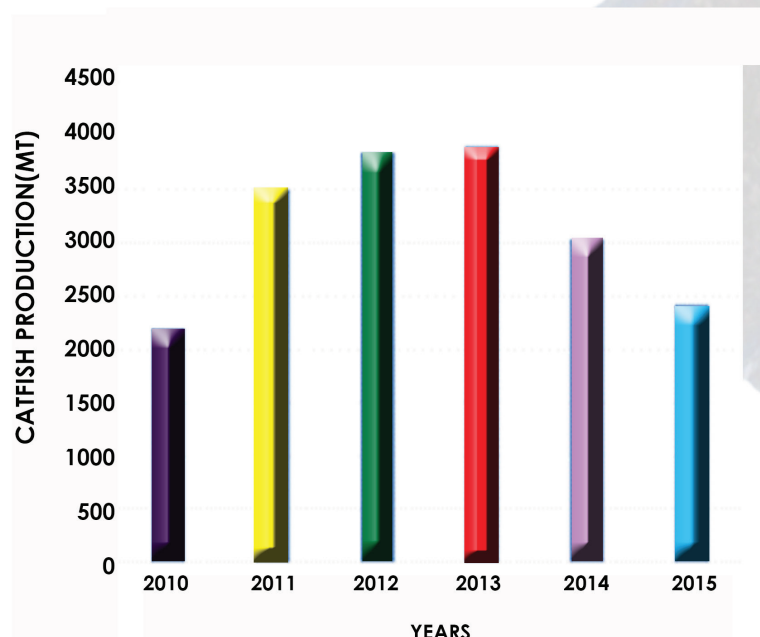
This limits availability of quality seeds for expanded *Clarias* culture enterprises.

Causes of high mortality of Catfish fry



Current Scenario

The culture of *C. gariepinus* in Kenya is poorly organized, with sourcing of seeds from the natural (wild) aquatic habitats whose quality is not known, or from farmer owned nearby hatcheries, whose stocks are of mixed origin and poorly maintained, so they obviously suffer poor genetic quality that deprives the stocks of vigor to grow and survive. Similarly, farmers hardly practice good catfish husbandry practices on their farms, and this further reduces the quality or vigor of the fish. This inevitably leads to cannibalism among the batch of catfish fry or larvae, which increases mortality among the fry hatched in a batch, with overall effect on low annual farmed production of catfish in Kenya



Graph representing Catfish production in Kenya in the years 2010 - 2015
Source: Department of Fisheries.

What should be done?

| SN | Action to be taken | Responsibility |
|----|--|---|
| 1. | Establish and maintain nuclei hatcheries to manage multiplication and distribution of quality catfish seed | County Governments |
| 2. | Certify the established nuclei hatcheries to ensure best practices are used in seed multiplication | Private sector Research Institutions: University of Eldoret |
| 3. | Avoid movement of catfish brood stock and seeds across drainage basins | National Government: State Department of Fisheries |
| 4. | Ensure proper husbandry practices in rearing of catfish on farms and hatcheries. | Farmers Extension service providers |

| SN | Benefits of implementing the recommendations | Effects of not implementing the recommendations |
|----|--|--|
| 1. | Increased availability of high quality catfish seeds will increase food and nutrition security among local communities | Perpetual shortage of catfish seeds will hinder expansion of catfish farming, leading to food shortages and income |
| 2. | Best management practices will increase efficiency of catfish seed multiplication and rearing, hence higher food fish production | Inappropriate management practices will increase inefficiency of the enterprise, and further reducing catfish production for food. |
| 3. | Restricting trans-basin movement of catfish seed will reduce pollution of the indigenous catfish germplasm, increasing the purity and quality of brood stock and higher production of food fish. | Increased pollution of catfish germplasm will reduce the quality of brood stock, and exacerbate mortality of fry, hence lower food fish production |
| 4. | Proper husbandry will reduce cannibalism among fry, increase seed availability and so higher catfish production | Poor husbandry practices will exacerbate mortality of fry, and further reduce catfish production |



Fish Hatchery at University of Eldoret, one of those that could be considered to serve as a certified nucleus hatchery for *C. gariepinus* seed production and distribution to farmers.

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