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**Aquaculture in Ghana: Fish farmer increases farm profits and improves family nutrition**

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### Notes to broadcaster

Aquaculture is defined as the production of plants, animals, or both in a controlled aquatic environment. Fish farming is a major component of aquaculture.

The conditions for aquaculture are good in Ghana. The climate is ideal for raising tilapia and many other species, water quantity and quality are outstanding, there is an abundant labour force, and the country has enough agricultural resources to supply a large fish feed industry.

In the past, people in some parts of Ghana relied heavily on fishing for sustenance. But natural sources of fish have largely disappeared because of a variety of causes, including overfishing, using inappropriate fishing gear, deforestation and degradation of watersheds, climate change, urban development and destruction of water bodies. Ghana produces only about 50% of its fish demand, so there is a great potential for local farmers to fill this shortfall with farmed fish.

There are two challenges to making aquaculture a reality in Ghana: the lack of readily available tilapia fingerlings and the lack of readily available, standardized and affordable pelleted fish feed.

There is a limited supply of tilapia fingerlings available in Ghana, and the fingerlings are quite expensive. According to some sources, the price of fingerlings can be as high as 40% of the price of a mature fish. This high cost and the resulting low profit limits farmers’ enthusiasm for fish farming.

But Ghana is introducing a program to make fingerlings available year-round in large quantities, at a cost of between 2% and 7% of the price of mature fish. This will change the dynamics of fish farming dramatically.

Currently, commercial fish food is imported to West Africa from South America, the Middle East or Asia. The high cost of these imports places them out of reach of most small-scale farmers in Ghana, who substitute local feed made from palm oil residue and cassava peelings. These are low-nutrient materials, and result in poor quality and inconsistent fish production.

The script is based on an interview with Mr. Peter Opoku, a fish farmer from Mankranso, in the Ashanti Region of central Ghana, and Professor Stephen Amisah, Dean of the Faculty of Renewable Natural Resources, Kwame Nkrumah University. It addresses both of the challenges mentioned here in the Notes.

You might choose to present this script as part of your regular farming program, using voice actors to represent the speakers. If so, please make sure to tell your audience at the beginning of the program that the voices are those of actors, not the original people involved in the interviews.

You could also use this script as research material or as inspiration for creating your own programming on fish farming in your country.

Talk to fish farmers and aquaculture experts. You might ask them:

What are the market opportunities for producing and selling fish in your community, region or country?

What are the major production and marketing challenges, and what solutions have farmers found to address these challenges?

Estimated running time: 20-25 minutes, with intro and outro music

**HOST:** You are tuned to (*name of radio station*) and my name is (*name of host*). This is your favourite farmer program, (*name of program*). Today we are going to talk about fish farming, one way for farmers to reduce poverty, improve family nutrition and ensure food security. We will introduce you to a fish farmer who now runs a profitable fish farming business, and ask him how he achieved his success!

SIG TUNE UP AND FADE UNDER

Fish farming can be a profitable venture for farmers. But problems like lack of fish feed and the unavailability of fingerlings in local markets have prevented farmers in Ghana from getting the full benefit of raising fish.

Today, we will hear how some farmers are cashing in on fish farming. We will speak with two people: Mr. Opoku Peter, a farmer from Mankranso in the Ashanti Region of Ghana, and Professor Stephen Amisah, Dean of the Faculty of Renewable Natural Resources and Department of Fisheries at the Kwame Nkrumah University of Science and Technology.

Mr. Peter Opoku lives in Mankranso with his family. He has four children. He grows crops like maize, cassava, rice, and plantain and he raises fish. He also raises sheep, goats and poultry. Mr. Opoku farms on about 20 acres of land close to his house in the community. He uses the proceeds from the farm to feed the family and to cater for their other needs. As a family head, he has to attend funeral every Saturday and pay his contribution to the extended family. He says he covers all these needs with income from the farm.

Our reporter Kwabena Agyei visited Mr. Peter Opoku in Mankranso.

**SFX:**  FARM SOUNDS, SOUND OF RAIN.

**HOST:** We are in the rainy season in September in Ghana. The time is 9 a.m. and it has been raining since early morning, though not heavily. I accompany Mr. Peter Opoku to his farm about 25 minutes’ walk on a path from the community.

Mr. Opoku is wearing Wellington boots with farm clothes. The ground is muddy and slippery. I have to remove my shoes and wade through the water and mud. Frogs and toads jump everywhere as we walk towards the fish ponds. There are five ponds in all, close to a stream that has overflown its banks due to continuous rainfall over the past weeks. There are other farmers cultivating rice around the ponds. You can hear the croaking of frogs everywhere. I ask the farmer how he started raising fish.

**PETER OPOKU:** Just like it is raining right now, it was raining one day in 2009 when I came here to tend my rice and okra. There was a heavy downpour that morning and all the plants were submerged in water for a long time. I remember seeing so many toads and frogs. I even remarked to my wife that it was as if it had been raining toads and frogs.

At that time, a friend visited me here on the farm and suggested that I use this land for a business which was becoming profitable in the country. I wondered what kind of business waterlogged land could be good for. But the friend told me the land was suitable for fish farming. At first, I did not like the idea. But now I am enjoying the proceeds.

**Host:** What made you change your mind?

**PETER OPOKU:** I consulting with some people and decided to give it a try. First we used pick axes and shovels to dig a 50 foot by 50 foot by six foot deep trench.

The trench had filled up with water by the time we finished digging it. A fish farmer advised me to drain the water from the pond and remove all pieces of wood, dead insects, reptiles and leaves from the water.

After a week, the pond was full again. I was advised to wait about three weeks before putting fingerlings in the pond. They said this would allow the mud to settle and air to pass over the water in the pond so that a harmful substance from cut tree roots around the pond would not affect the fish.

After three weeks, the water was clear and you could see the bottom of the pond. This showed that the water was clean enough for fish.

**Host:** I see you have fenced the pond. Why?

**PETER OPOKU:** After cleaning the water, I fenced the pond with a net to prevent toads, frogs and snakes from getting into the pond before I put the fingerlings in. These animals eat the fingerlings. Also, snakes and other reptiles can multiply and take over the pond. This is dangerous to human beings too.

Do you see how the banks of the pond are slanted away from the pond? This is to prevent the banks from caving in and polluting the water. The pipe here at the corner of the pond is to drain excess water out of the pond so the fish cannot escape if the pond overflows. I grew grasses around the pond to prevent erosion of the banks.

**Host:** How did you stock the pond?

**PETER OPOKU:** I started the pond with 1000 tilapia fingerlings. The first fingerlings were not for breeding. I grew them for sale.

I did not have the money to buy compounded feed from the store. So I mixed maize and rice chaff with grated fish. It was not good feed, but I had no other option. The compounded feed from the store was selling for 100 Ghana cedis ($35 US) for a 50-kilo bag. One bag is enough to feed 1000 fingerlings for three days.

But my local feed did not make the fish grow well. I wanted to harvest them after nine months but they were too small to sell well. I had to leave them for another nine months. Out of the 1000 I initially added to the pond, I sold about 750 after 18 months. I got a little profit, apart from lots of fish that I ate myself, and those I gave to friends and family members. But I got hooked on fish farming from that first trial.

**HOST:** We will be back in a moment with more on fish farming, when we will hear from aquaculture expert Professor Stephen Amisah.

MUSIC FOR 15 SECONDS

**HOST:** You are welcome back. You are still on (*name of radio station*), listening to the farmer program (*name of program*). I will be speaking again with Mr. Opoku Peter a little later on. But now, let us listen to Professor Stephen Amisah, Dean of the Faculty of Renewable Natural Resources at the Kwame Nkrumah University of Science and Technology in Kumasi. He tells us about the challenges and prospects of fish farming in Ghana.

**HOST:** What are the challenges for local fish farmers?

**STEPHEN AMISAH:** One challenge is that most farmers cannot get readily available local feed for their fish. Most commercial fish feeds are imported and expensive. So farmers frequently resort to mixing imported feeds with local feeds. Farmers sometimes overfeed fish in ponds. Uneaten feed can decay and result in depletion of oxygen, harming fish.

Another issue is the inability of farmers to access credit to start the farm.

**HOST:** Why are farmers unable to get credit?

**STEPHEN AMISAH:** This is partly due to the fact that most farmers do not keep records of their farm activities. If they kept records, banks could review the records and grant them credit.

Also, most farmers establish farms without considering access to markets. This leads to low fish prices during harvest.

There is a lack of adequate information about aquaculture. Extension officers are not specifically trained on aquaculture. They are trained in general agriculture and they try to extrapolate their knowledge in agriculture into aquaculture. But the two are quite different.

For example, if one tries to apply the feeding regime of goats or sheep or poultry to fish, there will surely be a problem.

**HOST:** What about marketing?

**STEPHEN AMISAH:** People go to the markets to buy large tilapia. If a farmer introduces tilapia in ponds, the farmer will likely get a pond full of small tilapia, which do not sell well in the market. To get bigger tilapia, you have to do sex reversal.

**HOST:** Sex reversal? What is that?

**STEPHEN AMISAH:** This is something that fish breeders do, not farmers. At about 14 days old, the fingerlings are placed into a separate pool and given a special feed for 25-30 days which contains the male hormone testosterone. This turns all the fingerlings into males, which grow 30-40% faster than the females.Like I said, this is not something that breeders do, not farmers. For farmers, it’s recommended that they buy sex-reversed fish from approved sources.

But it can be difficult to buy fingerlings of sex-reversed fish. Also, sometimes the fingerlings may not be one hundred percent sex-reversed when you put them in ponds, they start reproducing and soon the whole pond is full of tiny fish. So farmers need buy fingerlings from approved sources.

**HOST:** Are there other challenges for fish farmers?

**STEPHEN AMISAH:** Sometimes people overfeed fish. The uneaten food decays and sinks to the bottom of the pond. This causes algae blooms which can be harmful to the fish, and must be avoided.

Another issue is that,from time to time, farmers need to dispose of the effluent from ponds. Some fish farms release effluent directly into a stream which may be a source of drinking water for a downstream community. Famers must lay effluent pipes at the bottom of the ponds. These pipes have a tap. The farmer opens the tap periodically so that effluent can be piped into a pit built to hold the effluent.

**HOST:** We are familiar with tilapia and catfish, but are there other species of fish farmers can raise here?

**STEPHEN AMISAH:** There is so much emphasis on tilapia and catfish, but there are other equally good and profitable species. Two are *Pareutropius debauvi*, also called the African glass catfish or *koboo* in the local Akan language, and *Pollimyrus adspersus*, the African lung fish, or *takeri si wakyi* in Akan. These species sell well in the Ghanaian market.

One of the most serious challenges farmers are facing now is the import of cheap, low-quality tilapia from China. Although they are banned, they still find their way into the country.

**HOST:** That was Professor Stephen Amisah, Dean of the Faculty of Natural Renewable Resources at Kwame Nkrumah University of Science and Technology.

Let us listen again to Mr. Opoku Peter as he tells us more about how he became a successful fish farmer.

**PETER OPOKU:** After the first harvest from my first pond, I got more interested in fish farming because people started coming from Kumasi to buy tilapia from me, even though I had only one pond.Marketing was not a problem; I sold all the fish the same day I harvested them! I sold one kilogram of fish for 10 Ghana cedis.

In 2010, I financed the construction of three additional ponds. Officials from the Ministry of Food and Agriculture advised me how to construct the ponds. I hired an excavator for the digging. The three ponds are 100 by 100 feet square.

Hiring an excavator was effective but costly. It cost 1,500 Ghana Cedis (about $405 US) for each pond. This is high for most farmers. In fact, I used the money from selling the fish from the first harvest to finance this construction.

**HOST:** Where did you get the fingerlings this time around?

**PETER OPOKU:** I bought them from Nana Siaw, a commercial fish farmer based in Kumasi. One thousand fingerlings cost about 500 Ghana cedis, about 166 US dollars. Each pond took about 2,500 tilapia fingerlings. I had to transport them about 25 kilometres to my farm. Farmers must transport fingerlings either in the morning or evening to prevent them from dying because of heat. I hired a Toyota pickup with water tanks to take the fingerlings to my farm.

With four ponds filled with 10,000 fingerlings, I had to feed them well so that they could grow at the appropriate rate.

**HOST:** Did you have any challenges this time around?

**PETER OPOKU:** I faced the same feeding challenge as with the first pond. But I developed an effective local feed made of maize, rice and cowpea mixed with fish and dried. The mixture is slightly soaked with water and rolled to form pellets. One 50-kilo bag of rice and one maxi-bag or 90 kilos of maize and a basket of *nsesaawa*, a type of fish sold in the local market, can feed four ponds for two weeks when you do caged feeding. This is far cheaper than buying imported feed.

**HOST:** Please explain what you mean by caged feeding.

**PETER OPOKU:** A metal net is put into the pond to enclose a number of fish, who are fed at one time. This stops the feed from getting into the rest of the pond.

**HOST:** How long have you been using your local feed, and how is it working?

**PETER OPOKU:** I have used this type of feed since Nana Siaw showed me. The fish are doing well with the feed. In my last harvest a few weeks ago, some of the fish weighed one kilo. Each kilogram costs 12 Ghana cedis now. I must say that fish farming is a profitable venture worth doing.

I am now able to pay my children’s school fees with the income from fish farming.

**HOST:** We heard some good words from Mr. Peter Opoku about fish farming. Now let us hear about the challenges he faces and the prospects for the farm.

**PETER OPOKU:** There is everything to gain from fish farming. It is not difficult to care for the fish. But there are some challenges. The first of these is the cost of fingerlings. This can account for up to 40% of the cost of mature fish.

Also, fish feed is difficult to get. It is imported, and is too expensive for most local small-scale farmers. This makes farmers resort to using unapproved local feeds made up of household leftovers. This can be harmful to the fish.

Regular cleaning of the ponds is also difficult. There is no equipment for cleaning or discharging fish effluent effectively. So the pond is sometimes not cleaned for a long time, and this can affect the quality and quantity of the fish.

Nets for harvesting are also difficult to find. You have to travel to the coast to buy them.

One of our biggest problems is the influx of tilapia from China. Fish farmers do not have a real problem with marketing in Ghana. But since the import of tilapia from China, our market prospects have gone down. Although the government has banned the import of tilapia, some still find their way into the country.

**HOST:**We have seen that there are good prospects in fish farming in the Ghana but there are problems. Here is Mr. Peter Opoku again.

**PETER OPOKU:** Fish farming is not the only thing I do. I also grow crops like maize, cowpea and rice. I use some of my crops to feed the fish. I have cassava and plantain too. I support the family by raising some animals for food and selling some.

I use about 10 acres of land for the fish ponds and the other crops. In fact, I am doing mixed farming. My wife and children help me in all the activities on the farm. My children feed the fish and tend the ponds while I go to the farm to tend the crops. This has helped to reduce the cost of farming. But I sometimes hire additional hands to help me on the farm.

**HOST:** Would you say fish farming has changed your life for the better?

**PETER OPOKU:** Life before fish farming was not all that good. But when I diversified into fish farming, I saw an increase in my income. I can go to the pond and take fish for meals at any time. My children like fish more than meat. They tell me that feeding them makes them happy. My annual income has gone up by about 40%.

We have an association of fish farmers in the region. I have attended many workshops that have helped me learn new ways of tending the fish. I have also learnt record keeping for all my farm activities. I keep records of the amount of feed I give to the fish and I monitor the water quality and other safety measures of the fish and the ponds. I check the fishes’ weight as they grow. I also keep records of my income and expenditures. This helped me to secure a loan from a credit union so I could purchase some equipment for the farm.

**HOST**: We have heard the story of a crop farmer who diversified into fish farming, and was able to meet all his obligations as a family man. Maybe you can also try fish farming. After all, fish are a good source of nutrition. And selling fish can fetch a good income.

My dear listener, this is where we will end our discussion. I will meet you again on *(name of radio station*) next week. My name is (*name of host).* Bye for now.

**Acknowledgements**Contributed by: Kwabena Agyei, Program Officer, Farm Radio International Ghana.

Reviewed by: Steve Amisah, Associate Professor, Department of Fisheries and Watershed Management, Faculty of Renewable Natural Resources, Kwame Nkrumah University of Science & Technology, Kumasi, Ghana

**Information sources**

Interviews with:

Peter Opoku, August 20, 2014

Professor Stephen Amisah, August 18, 2014

Augustine K. Opoku, MOFA, Kumasi Metro, August 19, 2014

Samuel Ayobi, MOFA, Mankranso, August 19, 2014

Kofi Takyi, fish farmer, Techiman, Brong Ahafo, August 20, 2014

Stephen Appiagyei, fish farmer, Techiman, August 20, 2014

Thomas A Tei, fish farmer, Akuse, Eastern Region, August 27, 2014. By phone.

Nana Siaw, fish farmer, Ahomaso, Ashanti, August 10, 2014.

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