

FISH TIDINGS

AQUACULTURE ZIMBABWE



What is Integrated Agriculture-fish farming?

Integrated Agriculture Aquaculture involves fish farming defined broadly as the concurrent or sequential linkage between two or more activities, of which at least one is fish farming. These may occur directly on-site, or indirectly through off-site needs and opportunities, or both (Edwards, 1997).

Benefits of integration are synergistic rather than additive; and the fish, crops and livestock components may benefit to varying degrees (Figure 54). The term “waste” has not been omitted because of common usage but philosophically and practically it is better to consider wastes as “resources out of place”



IAA System model



fish stocking



Synergies in an IAA System

Did you know that:-

- Fish are aquatic vertebrates that live in the sea and fresh water. Most fish have highly developed senses with excellent taste, smell and colour vision. They also have a 'lateral line system' of receptors that can detect the motion of currents, nearby fish and prey.
- They are capable of feeling pain, fear and psychological stress. Scientific evidence is also revealing that fish are far more intelligent than they appear. They have long-term memories, social structures and problem solving abilities
- With the declining number of fisheries worldwide and a steady increase in the demand for fish, fish farming has become a vital alternative for the supply of fish and fish products.
- Fish may die of old age, starvation, body injury, stress, suffocation, water pollution, diseases, parasites, predation, toxic algae.

DIVERSIFIED VS INTEGRATION

Diversification is different from integration.

The table below illustrates the difference between the two.

INTEGRATION	DIVERSIFIED
System interact to create a synergy	System Components (crops, fish and livestock that co-exist independently from each other
Recycling of resources to allowing the maximum use of available resources	Do not recycle resources
Crop residues can be used for livestock and fish feed, while livestock and livestock by-product production and Processing can enhance agricultural productivity by intensifying nutrients that improve soil fertility,	Serves primarily to spread risk
Reducing the use of chemical fertilizers	

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(from pg 1) A high integration of crops and livestock is often considered as a step forward, but small farmers need to have sufficient access to knowledge, assets and inputs to manage this system in a way that is economically and environmentally sustainable over the long term.

POTENTIAL LINKAGES OF FISH FARMING WITH LIVESTOCK AND CROPS

The main potential linkages among fish, livestock, and fish production concern use of **nutrients**, particularly reuse of livestock manures for fish production. The term nutrients mainly refers to elements such as nitrogen (N) and phosphorous (P) which function as fertilizers to stimulate natural food webs rather than conventional livestock nutrition usage such as feed ingredients, although solid slaughterhouse wastes fed to carnivorous fish fall into the latter category. In an integrated system, fish, livestock and crops are produced within a coordinated framework. The waste products of one component serve as a resource for the other. For example

manure is used to enhance crop production; crop residues and by-products feed the fish and animals, supplementing often inadequate feed supplies, thus contributing to improved fish, crop and animal nutrition and productivity.

Both production and processing of livestock and crops generate by-products that can be used for fish farming. Direct use of livestock production wastes is the most widespread and conventionally recognized type of integrated farming. Production wastes include manure, urine and spilled feed; and they may be used as fresh inputs or be processed in some way before use. Water from fish ponds is rich in nutrients and therefore used to irrigate the crops, completing the cycle.

The result of this cyclical combination is the mixed farming system, which exists in many forms and represents the largest category of livestock systems in the world in terms of animal numbers, productivity and the number of people it services.

BENEFITS

Benefits of an IAA system include:

- Produces nutritious food with modest labour demand;

- Increases and sustains farm productivity year round, even during drought;

Fish farming can boost productivity across the farm by improving water availability and providing a new and renewable source of fertilizer in the form of pond sediment. This can upgrade a subsistence farm into one that also produces cash crops. During drought which is expected to worsen in Zimbabwe with climate change, ponds can make practicing farmers more resilient.

The provision of additional water (water in ponds) in the dry season expands crop and vegetable production. Farmers can grow valuable crops like bananas and guava on the perimeter of their ponds, taking advantage of the water that seeps into the surrounding soil to keep their plants thriving. Also, the sediment dredged from the bottom of the ponds is an effective fertilizer that can boost crop production with just a single application.

- Wastes can be cost effectively collected;
- Production cost of the fish is low; Farm wastes and crop by-products used to feed fish since livestock waste is substituted for purchased feeds and/or chemical fertilizers.
- Fish farming can be cheaply and efficiently integrated into existing agriculture farming operations/activities. Particularly on sloping ground, a reservoir to store water during the dry season may be built and used for fish and agricultural production. At the lower end of the slope, fish ponds can be built. Various kinds of animals can be raised next to these ponds and can provide fertilizer for them. Water from the ponds may be used for watering adjacent gardens and crops. Mud that accumulates on the bottom of the ponds can periodically be removed to fertilize surrounding crops. -AZ 2012

Aquaculture Zimbabwe (PRP IAASL) project mini profile.

Having secured funding for the PRP third round, Aquaculture Zimbabwe set out to implement a livelihoods programme in two districts of Masvingo Province namely Chivi and Masvingo dubbed the Integrated Agriculture Aquaculture for Sustainable Livelihoods (IAASL) project, mainly focusing on freshwater fish farming activities with the aim of shouldering the broader PRP goal of preventing destitution by protecting and promoting livelihoods of the poor and vulnerable communities within Zimbabwe. The overall purpose and scope of this project is to increase food security, improve nutrition and dietary diversity options as well as increase disposable incomes of the chronic poor labour endowed households through the implementation of the IAASL system of production for sustainable livelihoods. The project mainly relies on community participation in the broader scope of activities such as fish pond construction and management, IAASL systems designing, fish farm best practices among others over a 12 month period (July 2011-September 2012) after which it is expected that the selected beneficiaries should be able to take full ownership of the project and ensure continuity in a sustainable manner. Aquaculture Zimbabwe provides the training and technical support while leading the implementation plan as outlined in the technical proposal narra-

tive. The AZ IAASL project arose from the realization that high levels of unemployment as well as local and global food shortages were set to persist and as such there was a need to come up with counter strategies especially for the rural poor communities with little if no access to cash and compromised food security options. A large proportion of the rural folk in both Chivi and Masvingo districts are dependent on subsistence agriculture, and poverty in this segment is a consequence of Low agricultural productivity as a result of long dry spells or erratic rainfall patterns. Furthermore, the chronic poor households in the two districts are marginalized by the fact that basic commodities in Zimbabwe are being sold in foreign currency which is difficult to come by. They are also faced with limited dietary diversity options, a situation which compromises health and life expectancy in an HIV/AIDS prevalent population.

To date 513 households have been registered and are benefitting from the IAASL project across the two districts. (302 in Chivi and 211 in Masvingo) with a total of 2230 members. (Chivi 1349) and (Masvingo 881). There are a total of 99 production ponds that have been constructed and stocked with fish to date with an estimated value of +/- USD \$ 300 000.00 at full growth. Of the 99 ponds 53 are in Masvingo district and 46 are in Chivi. The first harvests are expected early July for Households whose ponds were stocked in January and Febru-

ary. AZ is currently facilitating the establishment of strong market linkages between beneficiaries and potential buyers and so far beneficiaries have been oriented to the idea of organizing themselves into producer groups in order for them to increase bargaining power as well as for ease of market access.



Beneficiaries stocking fish at Chendebevu Chivi District

Households have also received hands on training using the Participatory Technology Development approach for all the IAASL activities from pond construction to post harvest technologies. Sustainability is guaranteed by the fact that 29 extension officers and 23 community development officers have been trained in the IAASL project and these will captain the projects after AZ pulls out. 10 hatcheries are also being established to ensure that Households will have access to brood stock to breed fish seed for their ponds. Chivi will have 6 hatcheries and Masvingo will have 4 by the close of the implementation period in September 2012.

AZ



Pond under construction

"AZ is currently facilitating the establishment of strong market linkages between beneficiaries and potential buyers and so far beneficiaries have been oriented to the idea of organizing themselves into producer groups in order for them to increase bargaining power as well as for ease of market access."



Beneficiary training

Bright future for Masvingo District

AZ approached us with the fish farming projects sometime in October 2011 on the onset of the rainy season while we were busy preparing our fields for planting as we normally do on a yearly basis. This is despite the fact that we almost always do so with nothing more than just a glimmer of hope that maybe this year things might change for the better considering that the erratic rains almost always yield nothing but major crop failures.

We were then assisted in identifying a good site for a fish pond which turned out to be a nightmare since the only potential site required a lot of hard labour moving boulders, earth, tree stumps, and roots etc which many households were not prepared to do. More so several organizations in the past have introduced themselves with larger than life projects and disappeared soon after. The frequent visits by the field officers thereafter were so encouraging that ten (10) households mobilized themselves and did the job.

On 2nd March, heads rolled in the community when the AZ team brought us our first stock of fingerlings; it is downed on us that this was a sincere idea after all.

Today we boast of two ponds stocked with +/- 22 500 fish that are visibly growing by the day.

Before these developments we were totally hopeless that our lifestyles would someday change from despair to hope.

The changes that have occurred so far indicate that of unity of purpose as a group due to cooperation and coordination of duties. We were hopeless that we would someday have a new source of livelihoods for our families since we last received good rains several years ago. The stresses of unemployment and idleness have since been relieved as a result of this project especially for our children who now have something to look forward to each day. The knowledge that we gained through training in aqua has elevated our status within our community even our neighbors look upon us with some form of admiration. However from all the changes, the Most Significant Change is that of hope for a brighter future

since Aquaculture has brought in a vibrant alternative source of livelihoods and is an excellent safety net in the face of very poor annual yields. With the IAASL project we foresee ourselves having improved access to food and proper nourishment, as well as access to incomes which we hope to use for school fees, clothes, and even investment in other livestock such as cattle for draft power, chickens, and goats. We hope to create a revolving fund for investment in farm implements and emergency security such as a bridal society. We hold on to this hope jealously and nothing can come in our way to dampen the zest we have so far. "Hapana chinhu kana munhu angachauya achitudzwa kuti hapana chinobuda...."



Pond construction: women empowerment

ZBC hosts Aquaculture Zimbabwe team

Unexpected news hit the ears of Aquaculture Zimbabwe team on 8 July 2012 when they were invited by the Zimbabwe Broadcasting Co-operation to explain their skills and knowledge to the interested farmers nationwide about fish farming. Mainly their targeted audience were the donors, lead implementing partners, Local implementing partners, Beneficiaries (Community), Government of Zimbabwe, Local authorities, and leadership, Collaborative programmes, International community among other groups. Mr. G. Tongowona (Senior Project Officer) and Mr. V. Zvarevashe (Project Officer) managed to go to Harare for the interview with Morris Ngwenya (ZBC presenter).

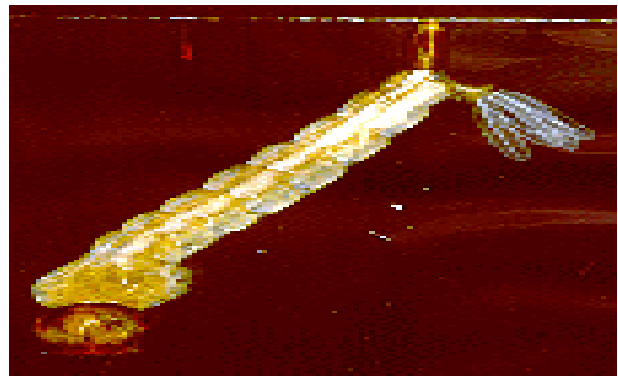
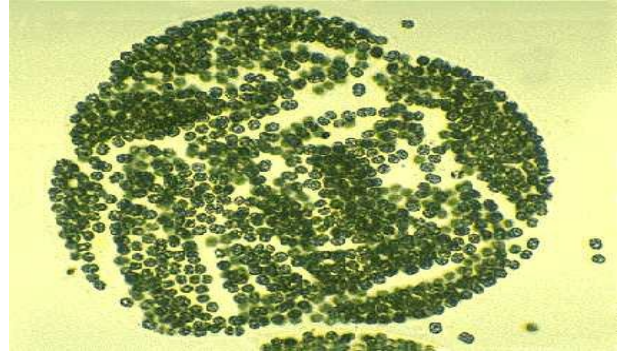
Basically the team was geared for the interview because it is one of the organisation's strategies to market the project as well as getting advice and information from other people. Some of the issues discussed

were: the definition of fish farming, major fish farming production systems, selecting a good pond site, when to build the fish farm, fish farming species, stages in fish development, fish nutrition, feed management among others.

The representatives of AZ managed to share the information to the viewers clearly and questions were being answered earnestly.

Mr. Zvarevashe explained that there are three methods that can be used to feed fish, the first method is boosting the naturally available food items algae through using fertilizer and the second one is using supplementary feeds (farm products) and the last one is using manufactured feeds like formulated feeds or pellets. He however said many people are comfortable with the first method of using naturally available food items because it is cheaper and affordable.

Naturally occurring food



Picture of algae and small insects that form part of the diet of fish in pond.

When tilapias are still small they feed on tiny insects called zooplankton in the water. As the fish grow they start to feed on phytoplankton or algae (mazerere in shona). The phytoplankton causes the water in your pond to appear green and grows naturally. He further explained that it is wise to increase the amount of phytoplankton by either adding manure or adding inorganic fertilizer. Sources of manure are manure from chickens, ducks and pigs and this increase production more than manure from cows and sheep. The manure producing animals are often located near the fish ponds to save money and effort on storage and transportation. Fresh manure can then easily be added to the pond on a regular basis. Also using manure from animals that have been fed high quality food, e.g. mostly grains instead of mostly crude fibre, is also recommended. Mr. Tongowona emphasizes on how to apply manure and he said farmers are advised to spread manure evenly over the surface of the pond, dump manure in a few spots. He encouraged farmers to apply fresh manure than dry manure because fresh manure quickly releases nutrients and algae formation is faster. "Feel free to contact anyone for more information, we are here to improve people's livelihoods in Zimbabwe. Thank you for your untimely support." said Mr Tongowona -AZ



before stocking



during stocking



weeks after stocking



months after stocking



To be the leading developmental, default networking front and information hub for sustainable, responsible aquaculture and fisheries systems supporting livelihoods in Zimbabwe

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