THE OFFICIAL NEWSLETTER OF THE MINISTRY OF FISHERIES AND MARINE RESOURCES

FOCUS ON AQUCULTURE

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1. AQUACULTURE IN NAMIBIA

Aquaculture Concept

On technical level Aquaculture is defined as "the farming and ranching of aquatic organism" but on popular level aquaculture sometimes is referred to as "fish farming". Aquaculture may be categorised into two, marine aquaculture and inland aquaculture. Marine aquaculture includes structures trays, pens, enclosures, nets, etc that are located in, on or close to unaltered marine waters. Whereas Inland Fisheries Aquaculture includes on hand facilities and utilizes ponds, tanks, and enclosures that are dependent upon the culturist for maintenance of water quality, food supply, and waste removal. Aquaculture that will involves both inland and marine components include hatcheries and re-circulating systems.

Aquaculture is a form of agriculture that includes the cultivation, propagation and marketing of aquatic organisms. Aquaculture shares many similarities in concept to many land based agriculture industries such as cattle farming and many of the same management techniques are used in aquaculture. Like more traditional forms of agriculture the goal of aquaculture is to maximize production at a minimal cost to maintain a profit margin.

Aquaculture is poised to become an important source of protein for the world's growing population. Because the capture fishing industry has peaked and is likely to decline as wild stocks are diminished, Aquaculture will become an important source of seafood products. Already nearly one third of all aquatic products consumed in the United States were produced on fish farms. Almost all of the catfish and rainbow trout, half the shrimp, and one third of all salmon consumed in the United States are raised on fish farms. The aquaculture industry of the United States, however, is very small compared to the industry in other nations. Below is a graph of the distribution of aquaculture production by volume worldwide.

Capture fisheries are the most widely known and recognized form of harvesting aquatic organisms and have been practiced since prehistoric times. Recreational fishing is a form of capture fishing, although for commercial purposes, capture fishing is much more efficient and productive. Culture fisheries involve growing a selected organism, or in some cases several selected organisms in a controlled environment, where the sole purpose of the organisms is to be harvested and then sold commercially. Aquaculture farms are very similar to their land based counterparts in terms of concept and management strategies.

As the world population continues to expand at an almost exponential rate, culture fisheries are becoming an ever more important source of food and resources. The natural stocks of fish that swim in the oceans can only supply a limited amount of food sustainably. Overfishing, pollution, and habitat destruction have severely limited seafood populations worldwide and experts believe the current level of fishing may not be sustainable beyond the year 2040. Faced with an ever-growing population and an ever-shrinking food source, culture fisheries may be one answer to feeding a ` hungry population.

A 300 gram fish at Shipapo wa Mbambangandu Fish Farm, Kavango Region.

The Ministry currently has 2 projects running in the North Eastern part of the country. These include the 6 community based fish farms (3 in the Kavango and 3 in the Caprivi Regions respectively) and the

Small Scale Fish Farming Projects which run throughout the regions.

2. AQUACULTURE IN THE KAVANGO & CAPRIVI REGIONS

Government has developed the 6 community based fish farms in Kavango and Caprivi Regions with a primary aims of Increasing food security, employment creation and income generation.

Cooperative members sorting and Grading Fish At Karovo Fish Farm, Kavango Region

The farms are owned and run by the Aquaculture Cooperative members and receive technical and other assistance from the Ministry. The Aquaculture Cooperatives consist of between 25 to 40 members each, and a total of 194 community members are currently employed on all 6 farms.

Each Fish Farm is approximately 1.8 hectares large with 14 earthen-based ponds (4 Breeding Ponds, 4 Nursery Ponds and 6 Production Ponds). The farms also have a modest office block, processing & storage facilities, and a farmhouse.

The farms are integrated agriculture / aquaculture initiatives with the establishment of horticulture and orchards developed to produce vegetables and fruits as supplementary products to the fish, which is our primary product.

It is estimated that each farm can produce approximately 20 tonnes of fish per annum at full production.

The farm's primary crop is Tilapia (*Oreochromis andersonii*), with trials for the culture of Catfish (*Clarias gariepinus*) currently underway.

Tilapia was selected as the specie of note as it is indigenous (occurs naturally) to the Kavango and Zambezi River Systems in these North Eastern Regions. In nature, tilapia is well known for its low oxygen demand, disease tolerance, and is known to grow larger in size than other similar species.

Vegetables (e.g. tomatoes, green peppers and

cabbage) and fruit (e.g. paw paws) are produced as supplementary cash crops

Marketwise, tilapia fetches premium market prices as it has a firm flesh, excellent taste and can be sold as a perfect fillet.

These farms currently target the local market for the produce from their farms. Once the farms are at full production cycle and these markets are saturated, we envisage expansion to regional markets.

The first official harvesting of the 3 fish farms in the Kavango Region is scheduled to take place during August with an estimated total of 2 tons (2000kg) of fish envisaged for harvesting at each farm.

3. SMALL SCALE FISH FARMING PROJECT

Emerging small scale (private) fish farmers fall within this project group.

To date, a total of 35 small-scale fish farmers have shown an interest in fish farming in the Kavango, Caprivi and Otjozondjupa Regions.

Within this project, 3 fish farming projects have managed to kick off with assistance from the Ministry. These include the

NDF Army Base at Grootfontein, Tsintsabis Secondary School which lies north of Tsumeb and Maria Mwengere Secondary School 15 kilometres out of Rundu.

NDF Army Base Fish Farming Project: Grootfontein.

After the site inspection was completed, 900 fingerlings (small fish) of between 25 – 30g were delivered to this project during February 2005. The fish has grown and spawned (reproduced) and it has been observed that there are now 4 generations of fish in this fish pond. Recent estimates show that fish now weigh between 250 to 400 grams.

Tsintsabis Secondary School Fish Farming Project

Approximately 200 fingerlings (weighing between 20 to 30g) were delivered to this school during February 2005. Low mortalities have been recorded; fish are growing well and have spawned at least 3 times to date.

This fish farm is exemplary in that fish farming as a component of the School Curriculum is now being offered in theory as well as in practice.

Recent estimates show that fish now weigh between 250 to 300 grams.

Maria Mwengere Secondary School

Ministerial staff conducting a site inspection at the Maria Mwengere fish pond

This is the most recent fish-farming project, which was established with funding from the Namibia Nature Foundation.

This fish-farming project consists of a rectangular concrete pond with rounded edges.

Construction of the pond has now been completed and it is envisaged that fingerlings will be distributed to the project once the fingerling distribution programme commences at the end of August 2005.

4. FISH HARVESTING TAKE OFF AT ONAVIVI

The second harvesting and selling of fresh water farmed fish took place on 25 August 2005, at Inland Aquaculture Centre at Onavivi in Omusati region.

The recent harvesting follows the first harvest of two tones took tilapia took place in August last year. In addition to producing fish for consumption, the primary objective of the centre is breeding of fish for distribution to the communities and small fish farmers around the country, research, and training of farmers who are engaged in semi intensive aquaculture practices. Fingerlings amounting to 200 000 were distributed to 165 communities and small fish farmers in Oshikoto, Ohangwena, Oshana, Otjozondjupa, Hardap and Karas Regions since the opening of centre.

Speaking at occasion His Excellency President Hifikepunye Pohamba. He said the following the Government of the Republic of Namibia views the development of the aquaculture industry as a key priority due to its potential to improve our national food security, generate employment and increase investment opportunities especially in our rural areas. With the aquaculture legislation in place, the Government will continue to facilitate the expansion of aquaculture development in the country.

The President believe that aquaculture projects will provide an avenue for increased economic activities and that expansion of aquaculture will increase demand for fish feeds for our existing fish farms.

Dr. Abraham Iyambo, during harvesting.

The Minister of Fisheries and Marine Resources Dr Abraham Iyambo leading a team of fishermen during, the second harvesting at Onavivi.

The government encourages the practice of integrated fresh water fish farming with the production of vegetables, fruits and crops. The development of aquaculture industry requires a well trained work force, which will continuously carry out research on modern scientific methods of fish farming management.

5. INLAND FISHRIES INSTITUTE AT KAMUTJONGA IN KAVANGO REGION.

At present the government is building an Inland Fisheries Institute at Kamutjonga. The institute will be used for research and development of inland and freshwater fish in the whole country.

6. BRAIN BEHIND THE SUCCESS AT ONAVIVI

The successful completion and continued operation of the Onavivi Inland Fisheries Aquaculture is the outcome of the cooperation between Namibians Government and the Government Kingdom of Spain. The two Spanish experts who are training Namibians at the centre will allow their counterparts to take over responsibilities for the management of the aquaculture centre at the end the training. The government through the Ministry of Fisheries and Marine Resources will intensify efforts to provide necessary technical and managerial capacities to the people who engaged in aquaculture activities in Namibia.

Dr. Abraham Iyambo conducting an experiment.

Dr Abraham Iyambo taking water samples to test the temperature, amount of oxygen and the salt content of the water at Oshivero Dam in Omitara district of Omaheke Region.

The rapidly growing domestic and international demand for aquaculture products offers great opportunities to Namibia through increased employment opportunities in industrial sector. Industries in this domain include feed production and pharmaceutical production, veterinarian services, processing, packaging and cold storage, transportation, etc. This will generate an estimate employment figure of about 1,640 by the year 2009.

7. STATE OF WORLD AQUACULTURE

Aquaculture has shown rapid expansion in recent years. In comparison livestock meat production has been growing three percent per year over the same period and output from capture fisheries has actually fallen. In 1998, total world production of finfish crustaceans, (shrimps, prawns, crabs etc), and mollusc, (e.g. claims, oysters, mussels), from capture fisheries and aquaculture reached 117.2 million metric tonnes (mt)

A quarter of the fish eaten in the world now come from aquaculture. The inclusion of aquatic plants raises total production by further 9.6 million mt to 126.8 million mt, an overall increase of 19.9 million mt in ten years since 1989. Aquaculture by 1998 provided 31% total fisheries supply, compared to only 15 % in 1989.

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The Ministry of Fisheries and Marine Resources publishes the Fisheries Newsletter. We welcome news items and articles from all our stakeholders on matters relating to fisheries topical issues, legislative or policy implementation topics. Please send your contributions or comments to: The Permanent Secretary, Fisheries Newsletter, Ministry of Fisheries and Marine Resources, Private Bag 13355, Windhoek, Namibia Telephone: 061-2059911 Facsimile: 061-22456,

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