Aquaculture: A new trend and a big opportunity in Sindh, Pakistan

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Pakistan is an agricultural nation, with 70% of the population living in rural areas and engaged in the agriculture and fisheries sectors. In recent times, food security has become a major issue and challenge with the rapidly increasing global population anticipated to reach 9.6 billion people by 2050. As a result, poverty, unemployment and hunger are likely to remain pressing issues. The situation is alarming and has raised great concerns for governments and development agencies. With regards to foodfish, there is only one viable option, namely aquaculture, which is likely to play a significant role in mitigating the aforesaid concerns and meeting the increasing global demand for food.

Fish plays an important role in the diet of the people worldwide. It is a very rich source of essential nutrients and animal protein. A deficiency of dietary protein in humans leads to malnutrition, weakness, high infant mortality and health problems with the eyes, liver, kidneys, bone breakage and memory loss. This situation can be tackled by increasing food fish production through widely introducing, practicing and promoting community based fish farming in the hook and corner of the country. Aquaculture is a very viable method of food (protein) production, about seven times more efficient than cattle production, four times more efficient than pork, three times more efficient than raising pigs and one and a half times more efficient than raising chickens. Therefore increasing the consumption of fish is, relatively speaking, a good alternative for food security. Fish provide an essential source of income and contribute to reducing poverty in many parts of the developing world. The growth in aquaculture has been identified as a key driver in boosting the global per capita consumption levels of fish.

In Pakistan, Sindh Province is very rich in aquatic resources and has a strong irrigation network based on the Indus River, canals, barrages, reservoirs, lakes, waterlogged areas and village ponds. Beside this, the land of Sindh is very fertile for fish farming and therefore the majority of fish farms are located in Thatta, Badin and Dadu districts through which the Indus River passes. Badin and Thatta have waterlogged floodplain areas which are very suitable for fish farming. About 6,000 fish farms with an average size of 5-10 ha are functionally operating across the province and employing 20,000 people in this industry. Finally, the province and its districts have the greatest potential and huge opportunities for the sustainable aquaculture growth and development.

Farmers after facing immense agricultural problems, now are considering the aquaculture is the best alternate option for them. Aquaculture is a fast growing industry and is attaining a great significance in most of the rural villages of Sindh.

A new trend has been developed among the majority of land owner-farmers, so called agriculturists, who give their preference to convert and utilise their lands for aquaculture farming/production. From their point of view, it provides high yields and profit in less time with low physical and financial input and management; it also offers a good future and potential for small farmers. In the current environmental conditions, it is a relatively low risk and highly profitable business famously practiced throughout the province.

Carps are one of the most farmed groups of fish throughout globe. Commercial pond carp culture has significantly expanded and is now widely practiced in Sindh. It has been considered a very popular aquaculture production method by which different carps species are commonly cultured together in the earthen ponds in a polyculture system, which is relatively environmentally friendly. It is observed that most of fish farmers practicing carp aquaculture are selecting, rearing and harvesting indigenous freshwater species of Indian major carps such as, thela *(Catla catla)*, rohu *(Labeo rohita)*, morakhi *(Cirrhinus mrigala)* and common carp *(Cyprinus carpio)* along with exotic Chinese carps namely grass carp *(Ctenopharyngodon idellus)* and silver carp *(Hypophthalmichthys molitrix)*.

As a result of carp farming, farmers have been getting high profits and successful high fish production from their ponds, which are properly sited and built with careful assessment of water availability, quantity, quality, pond fertilisation, stocking, feeding and harvesting. One reason for the success is that farmers have been gathering scientific information, improving their knowledge and enhancing their capacities to practice commercial aquaculture.

Freshwater/inland fish farming is under the control of the provincial fisheries department who supply seed, operate hatcheries, provide extension services and facilitate interest free loans, and collect primary data. The department also promotes community based fish farming through extension manuals, brochures, case studies, exposure visits and by organising capacity building workshops and seminars with aim to practice and promote fish farming on modern methods and techniques based on scientific technology. In this connection, many fish farmers are connecting with the department to get assistance to expand aquaculture operations in their respective areas. The contribution of inland fish production from aquaculture to the country's GDP is growing yearly, with production increasing from 142,724 to 185,000 tonnes during 2012 to 2016.

Aquaculture as part of fisheries plays a modest role in increasing the national economy of Pakistan. Therefore, the main objectives of community based aquaculture development turn around ensuring food security, improving the financial status and well being of rural farmers and their families, reducing poverty and malnutrition, increasing export earnings and creating employment opportunities through expansion of the industry. This can be possible by utilising empty state land for aquaculture purpose and moreover improving the sustainability of our waters in terms of freedom from pollution, overfishing and ecological degradation so that, many benefits can easily be obtained for poorest people whose dependency is often based on these resources.

Aquaculture Production of Pakistan										
Year	**2016**		**2015**		**2014**		**2013**		**2012**	
Culture type	Production (tonnes)	%	Production (tonnes)	%	Production (tonnes)	%	Production (tonnes)	%	Production (tonnes)	%
Freshwater	185,000	99.93	151,055	99.92	148,266	99.92	148,008	99.92	142,724	99.92
Marine	123	0.07	119	0.08	115	0.08	112	0.08	108	0.08
Total	185,123		151,174		148,381		148,120		142,832	

Source: FAO-National Aquaculture Sector Overview Pakistan

Finally, the author urges provincial and federal government to drive their serious attention, invest resources and assist farms to implement good practices in planning, management and providing guidance to further expand the industry on a large scale as to further utilise the significant area of unexploited water bodies for sustainable community based aquaculture throughout Sindh Province, with a view to increasing the economic benefits for the national economy and for reduction of poverty and improved wellbeing among communities at the local level.

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