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Inland Fisheries: Current Challenges and Future Potential

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Short Communication

Food and nutrition security and the biodiversity conservation are the two leading sustainable developmental challenges of the 21 century. Nutritional deficiencies are commonly observed among women of reproductive age, pregnant women and lactating women. Children are also susceptible to nutritional deficiencies and to and ensuring their adequate nutrition is of great importance for any Nation. The nutritional deficiencies, if prolonged for longer durations and if not compensated with adequate quality diet leads to different consequences such as stunting and underweight among children. These health consequences are associated with poor academic performance, decrease in the earning potential and ultimately lead to lower economic development of the Nation [1].

Fishes provide both the macronutrients and the micronutrients essential, for the child growth and for health of pregnant and lactating women. Fishes are a major source of nutrition particularly the protein and DHA and yet they are affordable. Protein is an important constituent of the human nutrition. Fishes are the primary source of protein for many communities all across the world. Proteins are very important for muscle development and growth. It was previously estimated that the fisheries provide food for nearly a billion people all over the world and is important for the millions of households worldwide [2]. Small scale fisheries constitute nearly 85% of the world's capture fisheries conferring food and nutrition security. Out of this inland fisheries form a major contributor but it is often considered as an unorganized sector.

Additionally inland fisheries form a major source of revenue for rural sector in addition to regular farming. Therefore, inland fisheries can be a good and sustainable source of income to the rural families. Moreover, the capital investment for inland fisheries is also affordable. Intensification of the inland fisheries is done by means of inland aquaculture [3].

The condition of water medium is very critical for inland fisheries. The other major factors in addition to the water typology include fish resource, and social community characteristic, farming methodology, selection of the seed, stocking of the seed and institutional organization of fish ownership [4]. However, immense pressure on inland fisheries can reduce the yield potential and the type and size of the fishes being harvested.

Inland fisheries have the potential to form a dominant ecosystem in the rural setup providing food and income thus eradicating the poverty. However, it has to be noted that rapid progress and urbanization and the population growth can limit the inland water resources to a great extent thus reducing the probability of the fish production and yield. Apart from these there are several factors such as overfishing, water pollution, and degradation of the fish habitat, invasion of other water species and modification of the river flow direction. Occasionally the water resources are diverted to other uses such as household needs, bathing, washing and sanitation. This dwindle the water resources significantly thus affecting the fish production. Due to these factors the diversity of the fish species may also get affected. Infrastructure development activities such as diversion of the rivers and construction of the dams for the hydroelectric project act as contrary to the inland fisheries. The lack of production skills could significantly raise the cost of fish production. More over the current pandemic situation also affected the inland fisheries and global catch [5].

Particularly, the low-land areas with surface high water retention creating water niches are were valuable for aquaculture and inland fisheries. Depletion of these water resources owing to the seasonal variation can affect the community fish production. The flood plains and the reservoirs have more potential for the fish yield than lakes. Inland fisheries are marginalized and are impeded in several ways in its development due to restriction to the remote areas. The fisheries catch serve the domestic consumption and seldom enter the market and even they enter it does in an informal ways and poor infrastructure. Due to these factors, the national level contribution of the inland fisheries is not reliably calculated and only approximate estimations are made.

Small scale fisheries form the livelihood of millions of people in most of the developing countries. Fisheries management becomes very important for areas with limited resource, taking into account the economics, ecological, and other social parameters. Adaptation strategies also play substantial role in the modern inland fisheries. The solution lies in the application of the aquaculture technology in inland waters. Another solution is the use of fishes that grow rapidly and those with high economic value and increasing the seed stock of the fishes. Choosing the right fish species with high reproduction rates reduced the fishing pressure [6]. This form of livelihood diversification ensures the economic stability and removes the insecurity. Particularly, the small scale inland fisheries are growing opportunity for people living in the vicinity of the water bodies.

Inland fisheries also contribute to the environmental sustainability of conservation. This functions as alternative livelihood and societal buffer as they enhance the ecosystem functioning and ecological balance. During the pandemic the inland fisheries functioned as mid-pandemic alternate employment and income source and for meeting the consumer demand for food. Inland fisheries contribute to the human development index life expectancy and uplifting of the living standards. It was observed that global fish catch increased consistently over the past one decade. *Cypruinus carpio*, *Planiliza abu Leuciscus vorax*, *Carasobarbus luteus* and tilapias contribute significantly to the overall fish catch. These fishes have over all biomass diversity [7].

New policy developments include making an inventory of the wild aquatic species for application in the rice field ecosystem, contribution to the local catch, estimation of the rice field fisheries production,

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description of the fisheries practices and optimization of theprotocol, identification of the seasonal variations in fisheries productivity, development of the guidelines for the fishing practices , definition of different habitats and the fish requirements and improvement in the access to the fish. Certain fish species also need protection from becoming extinct.

Rice fields naturally provide aquatic habitat, essential nutrients, and other organic material for the seasonal spawning and feeding of the fish species. Rice fields can accommodate not only fishes but also molluscus, crabs, prawns, and aquatic plants for the sustainability of the aquatic ecosystem. The rice fields are the hydrological flows and water ecosystem and they can sustain the aquatic biodiversity and fisheries. However, the farming intensification and habitat modification has altered the way rice is produced and the duration of the crop. Seasonal fluctuations also contribute to the fish yield. Rice producing nations have greater opportunity to promote inland fisheries and the policy development for household food security and national fisheries production. Inland fisheries need attention from scientists, resource managers, policy makers, community representatives, and efficient water resource management.

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