

# Livelihood development of urban poor through urban and peri-urban aquaculture



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## **The world is urbanizing at a rapid pace**

- ❖ **UN estimates that by the end of 2005, more than half the earth's population will live in areas defined as "urban" though definitions of what is "urban" vary from country to country**

## **Poverty in cities is rapidly expanding**

- ❖ **Many of the world's poor are migrating to cities in search of income-earning opportunities**
- ❖ **The urban poor often suffer from malnutrition, mostly due to lack of purchasing power and high food prices**
- ❖ **Urban poverty and the related issue of urban food security are therefore of prime concern**

- ❖ **Asia is the world's most populated region; it is the home of more than half of humanity**
- ❖ **By 2015, it is estimated that 16 of the world's 26 cities with populations of 10 million or more inhabitants will be in Asia**
- ❖ **East, Southeast and South Asia are already the homes of some of the world's largest urban agglomerations**
- ❖ **The Asian urban population is growing at a rapid rate**
- ❖ **Dhaka, Delhi, Karachi, Seoul and Beijing all have populations in excess of 10 million inhabitants**

## **According to a report “Food into Cities” by FAO, 2001**

- ❖ Given the rapid rate of urbanization in Asia, the importance of efficient food supply should be recognised by all stakeholders as a means of adequately feeding cities and an important determinant of food security for the urban poor**
- ❖ Furthermore, the pressure put on land and water by the urbanization process puts urban and periurban food production increasingly at risk**
- ❖ This situation requires increased attention to maintain suitable land and water for food production**

City	% of city popn in national total	National animal protein consumption per capita			National consumption of fish capta/kg/Y
		total grams/day	thereof fish grams/day	% of fish in total	
Bangkok	10	22.9	9.6	41.9	32.5
Beijing	1	23.1	5.4	23.1	22.2
Colombo	3	11.9	6.1	51.6	18.1
<b>Dhaka</b>	<b>5</b>	<b>5.9</b>	<b>2.8</b>	<b>48.0</b>	<b>9.5</b>
Jakarta	4	11.5	5.9	51.4	17.4
New Delhi	0.3	9.7	1.3	13.7	4.3
Kuala Lumpur	6	43.1	15.3	35.4	55.0
Manila	12	25.2	12.5	49.4	33.4
Seoul	100	56.3	9.3	16.6	31.9
Singapore	9	55.2	26.0	47.1	70.9
Tokyo	24	35.2	15.8	44.9	51.1
<b>Asia</b>		<b>18.8</b>	<b>4.9</b>	<b>26.2</b>	<b>17.2</b>
<b>World</b>		<b>26.4</b>	<b>4.3</b>	<b>16.4</b>	<b>16.3</b>

**Source: Ruckes, 2000**

- ❖ **It is clear that feeding the growing urban population of Bangladesh is a matter of utmost urgency**
- ❖ **Since there are no simple solutions, policy and implementation measures to deal with feeding city dwellers have to touch on concerns ranging from agricultural productivity through post-harvest technologies, marketing and distribution to food safety and the adequacy of consumer incomes**
- ❖ **These concerns go beyond the geographical jurisdictions of City Council to the national level and, ultimately, the global scale**

# Fish and Bangladesh

- Bangladesh – a country with vast potentials with fertile land, water and human resources
- It emerged as the third richest country in respect of freshwater after China and India
- Fish and fisheries are part of our life and culture
- Native major carps, exotic carps, catfishes, tilapia, shrimp and prawn are main aquaculture species. Shrimp and prawn attracted world market.
- Bangladesh - 5th in terms of production and 7th in terms of value of fish and fishery product in the world

## **■ Fish contributes**

**64 % of the animal protein intake**

**6% of GDP**

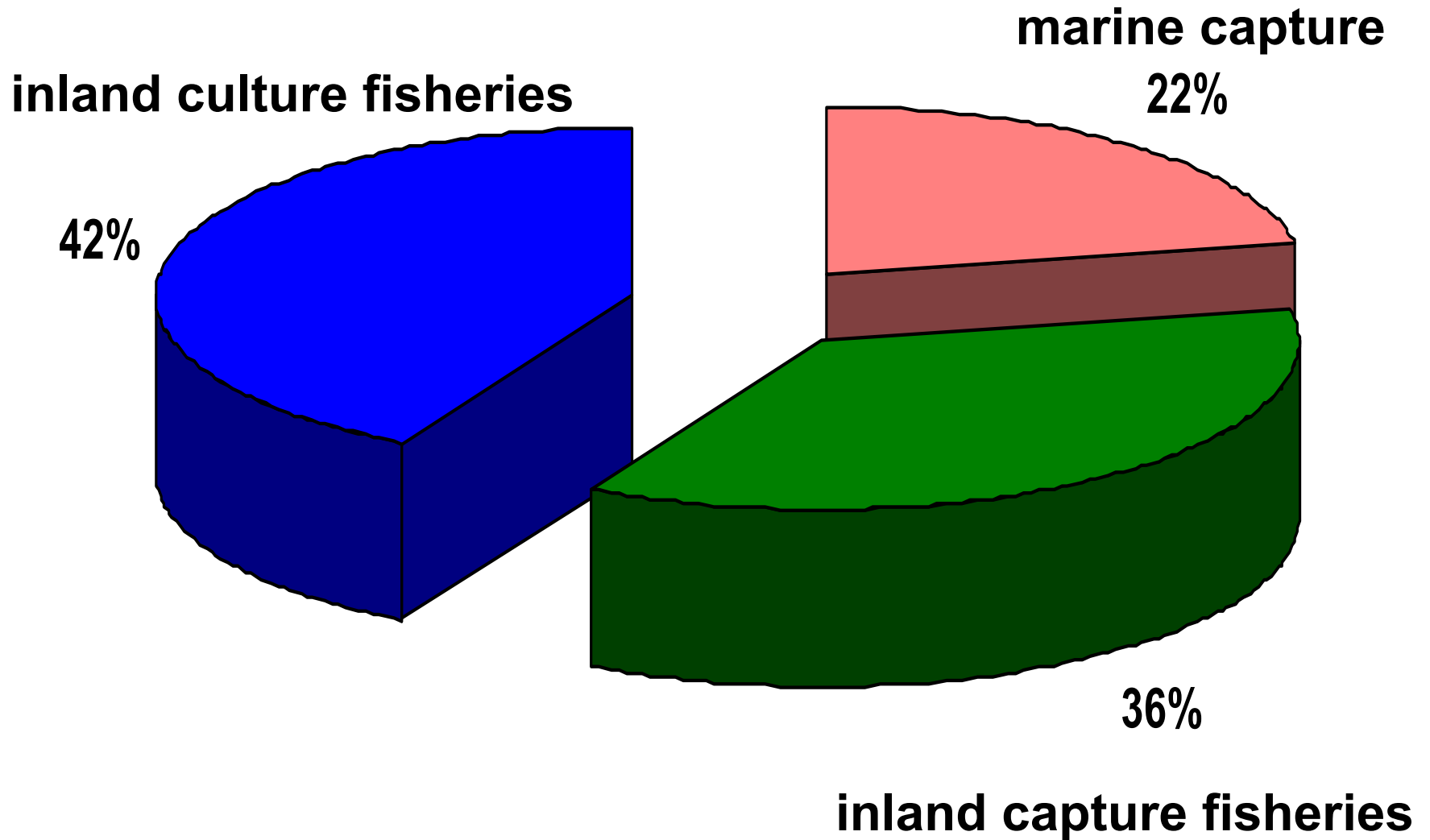
**4.91% of national income (DoF, 2005)**

**■ About 14 million people of Bangladesh are directly engaged in fisheries - 11 million in part-time fishing and another 3 million in aquaculture (DoF, 2005)**

**■ Bangladesh earns 5.71% of its export earnings from aquaculture (DoF, 2005)**



# sector-wise fish production in 2003-04



## Urban and peri-urban scenario of Bangladesh

- ❖ Asian cities are growing rapidly - many, including Dhaka, Bangkok, Delhi, Jakarta and Shanghai, can be classified as “mega city” with populations more than 10 million
- ❖ The growth of these large cities is accompanied by an increase in number of urban households living in poverty
- ❖ At present the number of urban popn. In Bangladesh is 37 million and it will reach to 80 million by 2020 (expected total popn. 175 million)
- ❖ Increasing natural disaster, landlessness and unemployment will enhance the migration of rural people
- ❖ At present 37% of poor of Bangladesh live in the urban areas, while food poverty is 42% among the urban population

**Spatially aquaculture in Bangladesh can be divided in to three categories**

### **Rural aquaculture**

**The main source of fish production in Bangladesh though has some problems especially in marketing**

### **Peri-urban aquaculture**

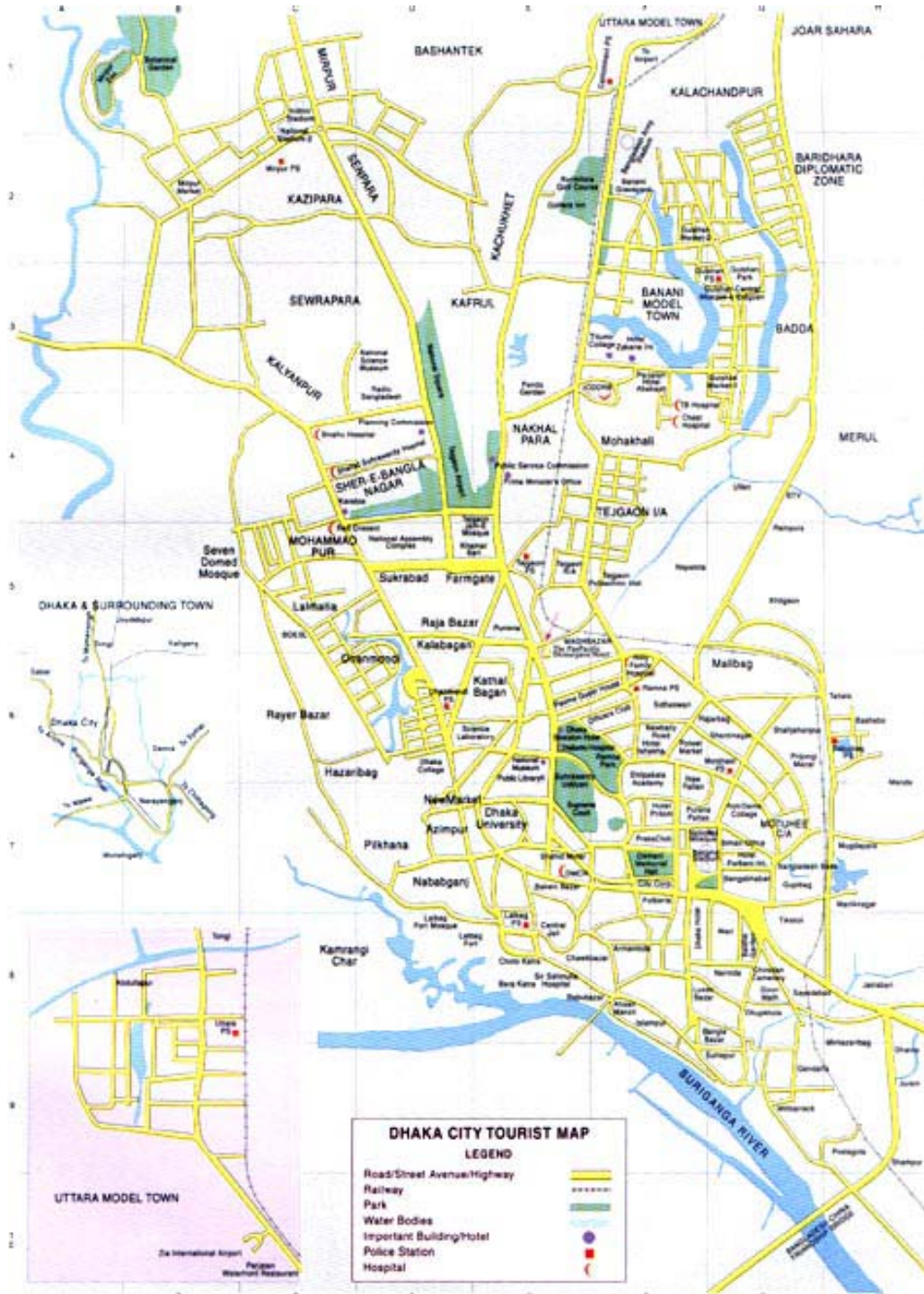
**Peri-urban aquaculture - could be an important part of aquaculture in the country owing to its proximity to the cities**

### **Urban aquaculture**

**Scope of urban aquaculture is limited due to lack of waterbodies, pollution and multiple use of water**

## Status of urban and peri urban aquatic resources and present practices

- ❖ Most of the Bangladeshi cities are located near one or more rivers
- ❖ Inside the city areas and in the periphery there are many ponds, lakes and open water bodies
- ❖ The 6 metropolitan cities – Dhaka, Chittagong, Khulna, Rajshahi, Sylhet and Barisal are rich in aquatic resources
- ❖ Especially the largest city Dhaka has numerous ponds, large lakes and open waters



## Potential large waterbodies of Dhaka

Name	Area (Ha)
Bagabhaban Lake	6
Gulshan Lake	100
Banani Lake	50
Dhaka Zoo Lake	50
Uttora Lake	100
Ramna Lake	75
Sangsad/Crecent lake	50
Govt. owned other ponds	100
Other privet ponds	400

- ❖ **Beside the waterbodies within the Dhaka city area, there are number of large ponds, beels, open waters, ditches and small river in the periphery of Dhaka, like – Jatrabari, Demra, Khilgaon, Tejgaon, Cantonment, Mirpur and other thanas**
- ❖ **During monsoon, the thousands of ha of land in the peri-urban areas of Dhaka become inundated with a high potential for short-term aquaculture (4-6 months)**

# **Aquaculture in Urban/peri urban areas of Dhaka**

- ❖ **Most of the water areas are not well managed for aquaculture**
- ❖ **In mid 80s there were two project to culture fish in Dhaka city under Department of Fisheries (DoF) – Dhaka City Aquaculture Project and Sub-project 3 under Integrated Aquaculture Development Project**
- ❖ **During the project period around 1,080 ha water areas within Dhaka city were identified for aquaculture**
- ❖ **Most of the water bodies are under jurisdiction of either BFDC or RAJUK**

**No proper fish culture is going on in the water bodies including the lakes in the Gulshan, Dhanmondi, Uttora, Cantonment areas**

**In other privately owned water bodies some people are culturing fish with very low input without any proper stocking or feed and fertilizer application**



- ❖ **Some people culture fish in pen in Baroigram, Nasir Nagar and adjacent areas under Khilgaon and Sabujbag thana for 4-5 months**
- ❖ **The local form teams of 20-25 people and make fencing (bamboo and net) based on the land ownership**
- ❖ **This way they build 60 -70 small to large ghers every year**
- ❖ **They culture pollutant resistant fish like tilapia, Thai pangas, use wastes of bread factories. Production is nearly 2.5 tons/ha**

## Case study – Trimohini, Nasirabad, Khilgaon

**Name of the farm owner:** Md. Barek

**Species:** Rohu, Katla, Big head, Silver, Tilapia and Carpio  
(No pangas because of high feed intake)

**Fish fry/fingerlings:** from commercial farms and supply to the pond just before monsoon (April-May)

During flood/monsoon when water level increases, they use net to cover their water areas

**Feed:** Rice bran, Rice polish, Wheat bran, Bakery byproducts, Oil cake and aquatic weeds

**Training:** Some of the local received training from DoF

**Harvesting period:** October - December  
February - April

**Fish selling:** Mughda Arot (wholesale)

## Case study – Kazla, Matuail, Demra

**Name of the farm owner:** Md. Shafi Uddin Ahmed

**Farm size:** about 20 ha

**Species:** Thai Sarputi, Kalibaus, Rohu, Katla, Big head, Silver, Tilapia and Carpio

**Feed:** Rice bran, Rice polish, Wheat bran, Bakery byproducts, Oil cake and Aquatic weeds

**Fertilizers:** Cow-dung and inorganic fertilizers

**Fish fry/fingerlings:** Hatcheries from Keranigonj, Norshindi farm and Jessore just before monsoon (April-May)

**Annual sell:** Tk 30 lac

**Full time man power:** 3 Supervisors and 5 Laborer  
(Seasonal fishermen hired)















## **Problem**

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- ❖ Dhaka City Corporation (DCC) waste dumping place is very near to these farms**
- ❖ Sewage from the dumping places and from the industry mix with the farm water and sudden death of huge amount of fish occur**
- ❖ The amount of sewerage water is very high especially during monsoon when the Rampura Sluice gate is open**
- ❖ Sewage from Dholaikhal and Maniknagar is very high in August-September**





## Overall problems

- ❖ **Infra-structural development specially the real estate is a lucrative business and people are building houses, office and other infrastructure in legal and illegal way over the lake**
- ❖ **Grabbing of Govt. water bodies is going on and on.**
- ❖ **Wastage from industries especially the toxic effluents mix with urban water and make the water unsuitable for household usage let alone the fish culture**
- ❖ **Fish mass mortality is very common and regular in city lakes**
- ❖ **Releasing predatory exotic fish in city water is also very common**
- ❖ **The ongoing culture practice lack trained personnel and any sort of fish culture technology**

# ফ্ল্যাট বানাতে গুলশান-বাড্ডা লোক ভরাট

অরুণ দত্ত

বাত্তার মরিয়ম টাওয়ারের অঙ্গুরে একটি হাউজিং সোসাইটির গুটি ও ফ্ল্যাট তৈরির জন্য গুলশান-বাড্ডা লোক ভরাট করা হচ্ছে। গতকাল শনিবার থেকে এ কাজ শুরু হয়েছে। এর সঙ্গে একজন ওয়ার্ড কমিশনারসহ ২০ জন জড়িত বলে জানা গেছে।

বিএলপি নেতৃত্বাধীন ছোট সরকারের পাল করা জনাধার সংরক্ষণ আইন উল্লেখ্য করে গুলশান-বাড্ডা লোকে অবধে এ ভরাটকাজ চলছে। জনাধার সংরক্ষণ আইন অনুযায়ী যেকোনো লোক, বিল, জলাশয়, নিচু জলাভূমি ভরাট করা বা সেখানে কোনো স্থাপনা নির্মাণ নিষিদ্ধ। অথচ গুলশান-বারিধারা-কনানী-বাড্ডা লোকে অবধে চলছে ভরাটের কাজ।

গতকাল দুপুরে সরেজমিনে দেখা গেছে, বাড্ডা মরিয়ম টাওয়ার-সংলগ্ন স্থানে সৈন্যপাড়াতে করে বতা বতা মাটি, বালি ও ইটের টুকরো এনে লোকের অংশ ভরাট করা এরপর পৃষ্ঠা ২ কলাম ৮

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রাজধানীর বাড্ডা এলাকায় মরিয়ম টাওয়ারের কাছে শ্রমিকরা গুলশান লোক ভরাট করছেন। গতকাল সকালে তোলা ছবি —প্রথম আলো

## **Case study – Aquaculture in and around Sirajganj town**

**Sirajganj town has a number of ponds, ditches and small beels, within its periphery**

**The urban aquaculture in Sirajganj town includes mostly the polyculture of Indian major carps and Chinese carps**



*Katakhali khal in Sirajganj Paurashava*

- ❖ **The existing culture practices is mostly extensive (only stocking), improved extensive (stocking and occasional feeding and fertilization) and with a limited scale, semi-intensive (stocking, regular fertilization and supplementary feeding)**
- ❖ **The production rate is very low**
- ❖ **Fish production in ponds in Sirajgonj city is as low as 0.5-0.6ton/ha/yr and as high as 2.5 ton/ha/yr depending on the culture system**







02/10/2005



06/10/2005

# Overall limitations of Urban Aquaculture

- ❖ **Water area use pattern (Regulation and legislation)**
- ❖ **Infrastructural development/ land grabbing**
- ❖ **Multi ownership and user conflict**
- ❖ **Lack of capital, technical know-how and trained personnel**
- ❖ **Non/limited availability of quality fish seed**
- ❖ **Annual flood and flush flood**
- ❖ **High input cost**
- ❖ **Pollution, fish mortality, exotic fish**

## **Possible solution**

- ❖ **Water area use pattern (Regulation and legislation):** The regulation for the water use in urban areas should be updated regarding controlling authority and towards environment friendly aquaculture production
- ❖ **Infrastructural development/ land grabbing** should be stopped with a severe consequence for the land grabber
- ❖ **Capital, technical know-how and trained persons** are prerequisite for urban aquaculture
- ❖ **Small-scale long-term credit** should be provided for the true farmer with the least interest possible
- ❖ **Training and other technical support** like – easy-to-use bangla manual for different type of fish culture) should be made available
- ❖ **Urban fish hatchery** should be built to supply quality fish seed
- ❖ **Sewage** should be treated before releasing to the urban waters
- ❖ **Indiscriminate release of exotic fish** should be prohibited

## **Sewage- fed aquaculture**

- ❖ Technologies for sewage-fed aquaculture should be made available and introduced in the outskirts of the metropolitan cities under GO and NGO initiative**
- ❖ Technologies for recycling waste water should be applied in urban aquaculture**

**More and more fish species and culture patterns should be brought under urban aquaculture**

- ❖ **In the urban areas, cage culture, pond-dyke culture, different type of integrated aquaculture and prawn culture should be introduced**
- ❖ **All 4 Indian major carps, the exotic carps and catfish, barbs (silver and Thai), tilapia, shing, magur, pabda, gulsha, tengra, koi, even some fresh water eels and minnows like mola and dhela and golda chingri can be cultured in urban waters**

## Urban aquaculture and livelihood of poor

- ❖ The only resource of the urban poor is manpower
- ❖ Many poor in the cities often do not have any job or specific skill to get a job in urban environment
- ❖ This un/semi-employed labour force (including women in the households) can be made engaged in aquaculture in public and private owned waters with little training, technical and financial support
- ❖ These people can be involved in every stages of the production cycle – farming, processing, transporting and retailing
- ❖ That will not only increase the total food production of the country, it will also help in using the urban waters in a eco-friendly way, creating employment, reducing the financial and nutritional poverty of urban poor



## Before starting the full-scale semi intensive/intensive type of aquaculture in the urban and peri-urban areas

Legal, regulatory and policy frameworks including flood control and environmental standards should be ensured

Capacity of city council should be built through technical and financial support, including providing access to and facilities for the dissemination of technologies and provide means for close coordination between the various stakeholders

## **The city council should -**

- ❖ formulate and implement sound urban aquaculture policies and programmes spanning urban and peri-urban areas**
- ❖ ensure urban planning, management and policy instruments such as, facilitating water management systems, identifying land for major infrastructure and solid waste sanitary system**
- ❖ carry out appropriate studies and surveys to obtain a better understanding of the water resources**
- ❖ ensure full participation of all stakeholders (producers, traders, transporters and consumers) in the planning**
- ❖ recognise the potential for private sector involvement and recognise the importance of the informal sector (street retailers and night markets etc.) and accept the sector's social, cultural and economic importance, particularly for the urban poor**
- ❖ make provision for and enforce nutritional safety, environmental and hygiene regulations**

## **The private sector should**

- ❖ **create appropriate stakeholder associations (*arotdars, forias*, street retailers, market traders, urban producers, truckers, consumers, women's groups, etc.), chambers of commerce and NGOs to enable an effective production, preservation and marketing system**
- ❖ **consider entering into partnerships with local authorities for facilitating investments in required infrastructure and services for urban and peri-urban aquaculture and take responsibility for the environmental costs of their operations**

## **What the international organizations and donor can do**

**recognise the growing importance of fish culture in urban areas and recognise the systems as deserving priority support and funding**

**recognise that urban aquaculture increasingly require an inter-sectoral perspective to address demand of animal protein in cities and suburbs**

**recognize urban aquaculture as a potential mean to sustain the livelihood of urban poor from the nutritional and socioeconomic point**

**provide support to enhance international information diffusion and technical assistance on good urban aquaculture practices**

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