

Selected sources of further information:

Project website: www.papussa.org

B. Costa-Pierce, A. Desbonnet, P. Edwards and D. Baker (ed). "Urban Aquaculture". CABI Publishing, 2005. Wallingford, UK.

W. Leschen, D. Little, S. Bunting and R. van Veenhuizen (ed). "Urban aquatic production", Urban Agriculture Magazine, Number 14. RUAF, July 2005. Leusden, the Netherlands.

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Challenges

Growing of fish and aquatic plants in water bodies in and around cities is commonplace in South-East Asia. Cities in the region have experienced rapid growth in recent decades. This has led to increasing opportunities, challenges and need for production and trading of aquatic food. Thousands of families are generating their livelihoods in aquatic production systems, while feeding an even larger number of urban inhabitants and recycling a large part of the city's waste.

Aquatic food production systems however have often only received limited attention by scientists and policy makers, notwithstanding their contribution to urban management. Peri-urban aquaculture not only contributes to food production, but can also become an important income source for urban producers and vendors.

Investment and support is needed to further develop and increase the sustainability of peri-urban aquatic production systems, while regulating potential health and environmental risks. Governments should recognize the role urban aquaculture plays in local urban development, promote and manage it through policies and interventions that meet public needs. Producers, on the other hand, need to adopt better production practices, while vendors and markets should assure food hygiene, both adhering to commonly agreed upon food safety parameters.

AQUACULTURE

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Why are aquatic production systems important to South-East Asian cities?

Employment creation and income generation

Aquatic production systems generate significant incomes and employment for specifically the poorer population. Commercial vegetable and fish producers in Bangkok (Thailand) for example have average earnings of 4- 8,000 US\$ per annum, while households in Phnom Penh (Cambodia) growing water spinach as an additional income-source still generate between 200-500 US\$/annum.



Source of nutritious and affordable food

Aquatic production systems provide a source of nutritious and affordable food to the growing urban population. 10-20% of the freshwater fish consumed in Hanoi (Vietnam) comes from peri-urban production, while the considerable daily demand for aquatic vegetables is met almost entirely by production grown in peri-urban areas.



Greening the city while recycling waste water

Aquatic production systems treat wastewater effectively, while reusing both nutrients and water and, in so doing, contribute to greener cities. Conventional treatment of urban wastewater is often not an option for fast growing cities in poorer countries and, provided public health issues are addressed, aquaculture systems can be both cost effective and a practical low-cost treatment alternative.



The benefits in terms of food, the environment, and job creation explain why cities should begin to target and incorporate growing fish and aquatic vegetables into their current and future urban management strategies.



DFID Department for International Development

AFGRP aquaculture and fish genetics research programme

ETC



PAPUSSA Production in Aquatic Peri-urban Systems in South-East Asia

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Aquatic production systems:



income of US\$ 80 million a year (Department of Fisheries, 2004). Bangkok farms also produce more than 70% of the country's total production of catfish (around 80,000 tons). In Hanoi (Vietnam), the land area to produce fish increased over the past 13 years from 2061 to 3348 ha, with the associated yield more than doubling, from 4207 to 8972 tons (Hanoi Agriculture and Rural Development Department, 2004).

Urban areas are dynamic centres radiating change and innovation. Integrating aquaculture production systems in urban development strategies can help growing better, more productive and greener cities.

An increasing amount of information on peri-urban aquatic production systems in South-East Asian cities, their benefits and constraints has now been made available through the PAPUSSA Programme (Production in Aquatic Peri-Urban Systems in Southeast Asia), a collaborative research project, funded by the European Union, between European and Asian partners in Hanoi and Ho Chi Minh City (Vietnam), Phnom Penh (Cambodia) and Bangkok (Thailand).

To strengthen the peri-urban aquatic production and marketing systems in the above-mentioned cities, as well as in other South-East Asian cities, stakeholders in these cities have identified 4 key recommendations as listed below. These recommendations have been ratified by consensus, through a series of participatory consultations with local and international actors held throughout the years 2003- 2006.

Each of these recommendations will be addressed in greater depth in a separate Policy Brief. All guidelines are based on current scientific and technological research and reflect the increasing information now available about peri-urban aquatic production systems, their benefits and constraints. The purpose of the briefs is to assist in the process of decision-making rather than to provide definitive answers.

We invite all governments and stakeholders in peri-urban aquaculture to study these guidelines and put them into practice, as a means of improving the quality of life of their citizens and promoting the sustainable development of their cities.

In Asia, urban areas today account for 35 percent of the total population, with an increasing number of the region's poor living in urban areas. Reducing poverty and hunger by half, as well as universal water supply and sanitation coverage by 2025 - both now widely acknowledged goals- will mean that millions of people in cities are in need of food, water and sanitation services.

Meeting basic human needs for healthy food by urban consumers, disposal of waste in urban centres and development of sustainable systems which can re-use water more effectively, constitute major challenges for the future. Agriculture and aquaculture production will not only have to occur in rural areas but also increasingly in peri-urban areas that can be centres of marketing and distribution, but also of recycling and production (B.Costa-Pierce, A. Desbonnet, P. Edwards and D. Baker).

The proximity of peri-urban areas to ever-increasing markets give these peri-urban systems a comparative advantage to rural ones in producing and selling large volumes of fish and aquatic vegetables all year round. Around 30% of Thailand's aquatic inland production comes from Bangkok peri-urban areas, generating an estimated

Contribution to sustainable urban development

1 Integrating aquaculture into urban planning and development

Aquatic plants and fishery products constitute an important part of people's diet in South-East Asia, especially for the poor. Rapid urbanisation is however posing a threat to peri-urban aquaculture, not sufficiently recognising its contribution to social and environmental sustainability. The new challenge for planners is to accelerate aquaculture development and to plan for new production. Aquatic production systems should be acknowledged as a legitimate land/water use and integrated into urban development and land use planning. Multifunctional land use and zoning, combining urban aquaculture with open and green space management, recreation, and flood control should be promoted, while securing aquatic producers longer-term tenure of land and promoting safe use of wastewater. Institutional support for urban aquaculture should be strengthened by creating a specific programme or unit for urban aquaculture, involving peri-urban producers directly in action planning and policy development.

2 Managing health risks to develop wastewater into a valuable resource and asset

With increasing water scarcity, wastewater is a resource of increasing global importance, particularly in urban and peri-urban agriculture and aquaculture. With proper management, wastewater use contributes significantly to sustaining livelihoods, food security and the quality of the environment. Without proper management however, it may pose serious risks to human health and environment. Therefore, health risk reduction strategies should be put in place, varying from awareness raising and use of protective methods during production and marketing in the short term, to separation of industrial and domestic wastewater and providing low-cost wastewater treatment systems in the medium to long term. Institutional coordination among authorities, donors and private sectors in the field of water, aquaculture, health, environment and urban planning should be improved to adopt appropriate policies for the safe re-use of wastewater and the commitment of financial resources for policy implementation.

3 Improving public health and food safety

Key to the future of peri-urban aquaculture, are the issues of food safety for consumers and occupational health risks for producers. Further research is needed to assess the absolute and relative health risks related to wastewater and agrochemical use in aquatic production systems. Water and product quality standards should be applied and monitored, and linked to product certification and improvement

of hygienic food handling at urban markets. In case of increasing pollution and food safety problems, alternative and low-risk production systems should be explored, such as production of ornamental fish, flowers and water plants.

4 Promoting sustainable production and marketing to reduce poverty and hunger

Finally, and to enhance the sustainability of aquaculture production and marketing systems, more information and research is needed on improved and new systems and techniques for aquatic production, specifically environmentally sustainable production and development of new product lines. Aquatic plant cultivation or ornamental fish production are among the viable and financially attractive production systems to be considered. To increase producers' access to extension and technical assistance using more innovative and user friendly dissemination methods, further development of educational and training materials on aquatic production systems and the introduction of the topic in school and university curricula is also needed. Organisations of peri-urban aquatic producers should be strengthened for them to gain or improve access to resources as well as official recognition and direct participation in processes of urban planning and policy making.

