An Overview of The Current Status of Peri-Urban Aquatic Food Production Systems In Phnom Penh

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Project activities

Year 1
Situation appraisal and feedback

Year 2. Production systems and livelihood monitoring
Baseline and monitoring survey
Water sampling

Year 3. Production systems and livelihood pilot
Intervention

Institutions assessment
Marketing survey: fish and aquatic plants
Identify representative communities
Feedback SOS report
Participatory Community Assessment (PCA)
Background of Cambodia

- Cambodia is located in Southeast Asia
- Population of Cambodia – 13,770,000 (2003 projected)
- 11,426,223 (1998 census)
- Two season: Wet and Dry
- Particular river system (flow back)
Background of Phnom Penh

- Total area: 375km²
- Located alongside the Mekong River
- Population: 1.3 mil.
- Population growth rate: 3.2% per year
- GNP US$ 830 per capita, 80 times less than Thailand and Singapore.
• City Surrounded by many swamps and lakes
• 80% natural lake and agriculture.
• Medium density: 130 p/ha
  (500 p/ha in the centre and 50 p/ha in the suburb.)

• Phnom Penh has increasing major industrial and commercial activities

• Almost all of the domestic waste water of the city and industrial wastewater discharges into Cheung Ek lake.
Improvement of urban drainage and flood control system by JICA

Cheung Ek Lake
PCA (Participatory Community Appraisal)

Aquatic Plant Production

- Tnout Chrum village and Kbal Tom Nub village (Boeung Cheng Ek Area): large quantities of morning glory in a mixture of domestic wastewater discharged from other factories.

- More than 400 HHs live within and around the lake involved in Morning Glory production.

- The Morning Glory is grown with floating raft (rope network) in the water.
Production Seasonality

- negative effects of waste water is far worse in Dry season.
- Dry season water quality causing problems and loss of production with diseases on the plants
- Rainy season causes many diseases especially for children (dengue fever).
Muoy village is more towards the centre of the city.

20-30 households produce Pangasius in net pen enclosures under their houses.

Many kinds of fish feed are used e.g. rice bran, livestock and human waste, etc.

Antibiotics are also mixed to the feed when their fish get diseases.
Fish Culture (Cont.)

- **Duong village** is about 15 Km from the centre of the city.
- Many households of the community culture mixed fish but mostly **Pangasius with Non-wastewater**
- The source of water originates from the nearby Lake and Tonle Sap River.
Livelihood diversity

In the communities in which aquatic vegetables and fish are important, livelihoods are very diversified.
Photos taken during PCA activities in 4 sites
Community Mapping

"Artist at work!"

Presenting the findings

Group Discussion

Community Mapping
Market Channels

Producer/Wholesaler

Wholesaler/Collector

Retailer

Consumer
Markets Survey

- Majority of fish sold in PP-markets sold fresh or live

- Major transportation for aquatic plants and fish: motorcycle-taxi
Markets Survey

- 233 interviewees consisting of wholesalers/collectors, producers/wholesalers, retailers, and consumers.
- Marketing questionnaires to interview market actors buying and selling aquatic plants (morning glory and mimosa) and aquatic animals (*Pangasius*, *Clarias* catfish and big snakehead fish).
Summary from Markets Survey

- Mainly women play a role in markets.
- Seasonal fluctuation in quality of products lead to selling Morning Glory in the dry season for livestock feed (lower human consumption).
- No distinct wholesale markets in PP.
- Mimosa commands a higher price than MG.
Institutional Linkages

Level

National Level
- Ministry of Environment
- Ministry of Public Health
- Ministry of Agriculture Forestry and Fisheries
- Ministry of Land Management Urbanization Planning and Construction

Regional Level
- Department of Environment
- Department of Health
- Fisheries Office Agronomy Office
- Department of LMUC

Local Level (Peri-urban)
- Local Authority Commune
- Village
- Community

Environmental Institutions

Product and Development Institutions

Major Influencing Institutions

Others:
- JICA
- NGOs

Others:
- Fisheries Office
- Agronomy Office
- Department of LMUC
To validate our findings from the years research with different groups of stakeholders

To collect additional information about Markets and institutions

To combine ideas from participants for resolution – setting up research and action agendas
### Problems by stakeholders (SOS)

#### Producers
1. Increase **waste water** from factories and city
2. **Skin diseases** and lack of hygiene
3. Impact from waste water to health
4. **Surplus product** problems
5. Flooding
6. **High cost** for investment

#### Local officers
1. **Polluted water** to people health
2. Lack of **fresh water** for village
3. Lack of **medical centers**
4. Lack of **hygiene toilet** in village
5. Aquatic product **market** is small
6. Weakness of **law enforcement**
7. Limited **technique** and knowledge

#### Market sellers
1. **Oversupply**
2. Inappropriate **place** for selling aquatic product
3. High price of **gasoline**
4. Instability of aquatic **product price**
5. Lack of **technique** for product preservation

#### Policy makers
1. Bad **infrastructure** for transporting
2. Lack of **medical center**
3. Lack of **fresh water supply**
4. **Ecology** changing in community
5. Lack of knowledge of using **chemicals**
   Lack of wide **extension** of the use of chemical
Household Baseline Survey May - July 2003

Baseline Survey

No. HHs

Communities

KBT  TCH  Duong  Muoy  Buon

73  60  28  14  25
Baseline Survey Result

Gender of Respondents and Income Source

- Respondents are women more than men in Aquatic Area

- HHs in Aquatic vegetable production have more income sources than fish culture
Households Size by Village

- MG HHs generally have larger number of members compared to fish culture
Migration by Village

- Most of HHs born in their village
- Many migrate from other provinces for business reason
% Gender of HHs Head by Production system

- Most of the HHs are men roughly 80-90%,
- Morning Glory community have higher Woman HHs (widows) than fish

• Female more involved in Aquatic plant while men in fish
• Clarias Catfish well distribute in wealth ranking

• Morning Glory ranked poor to medium (no rich)

• Fish NWW and MG have more poor than Fish WW (implied Central and Peri-Urban)
% Education of HHs Member by Production System

- Only HHs member in Fish Production belong to College/University Level
- Fish NWW and MG have higher education level than Fish WW (implied Central and Peri-Urban)
• MG-WW produce higher yield than fish farming
• Fish-NWW produce higher yield than fish-WW
- High % own only house plots (Muov village -WW)
- Duong Village and Buon village (Fish) own bigger land plots
- Kbal Tomnub and Thnout Chrum (MG) own small plots
Land access right by production system

- More producers access land between 1000-5000 sq. meter
- MG is likely produce lowest income among others (<500 and 500-1000)
- Pangasius WW ranks in lower, perhaps due small production area
- Pangasius NWW ranks in high income but high cost of production
- Clarias NWW ranks the highest income (3 month per crop)
- MG gain highest productivity but lowest income
- Clarias rank the highest income followed by Pangasius NWW then Pangasius WW
AFPS training

- Both Fish and MG production got very few AFPS training

Morning glory - wastewater

- Fish Farming: 92%
- Hatchering operation: 3%
- Aquatic Plants Management: 3%
- Pesticide/Fertiliser application: 2%
- None Training: 0%

Clarias catfish

- 88.89%
- 11.11%
- 0.00%
- 0.00%

Pangasius - non wastewater

- 91.89%
- 0.00%
- 2.70%
- 5.41%
- 0.00%
Water and Electricity Supplier by Village

-In aquatic area, most of water supply come from Borehole, but people in Muoy do not use Borehole but main water

-Generators for electricity used in Buon and Duong village
Credit Sources

- More %HHs in MG production take credit more than fish do
- Skin Problems and fevers and Diarrhea are more likely for morning glory producers who are in contact with waste water

- Skin problem become worse during dry season (Monitoring 3)
Toilets by village

- Most MG HHs have no toilet
- Buon and Duong (Community far from central city) use more outside toilets
Institution in Aquatic production

- For MG, More institution (NGOs and civil group): Education support, Micro credit, Youth union, Children care center
- For Fish, only NGOs
MONITORING (SEASONALITY)

Fish Mortality by Species

- Pangasius WW mortality is seasonal, more in December
- Major cause of mortality is disease and polluted water
- Technical problem is also in concern of mortality
Institutional Issues

- There is a lack of communication between government and existing non-government institutions.
- Although the Cambodian Government promotes aquatic production, the role of institutions is not clear with regards to peri-urban aquatic systems.
- For all these reasons the people from the peri-urban communities are reluctant to be involved in the projects, mainly due to a lack of trust.
Future of the Production

- City plan preserve the lake for Biological Waste water treatment plant but lake area will be reduced by 4 times.
Thank for your attention

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