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

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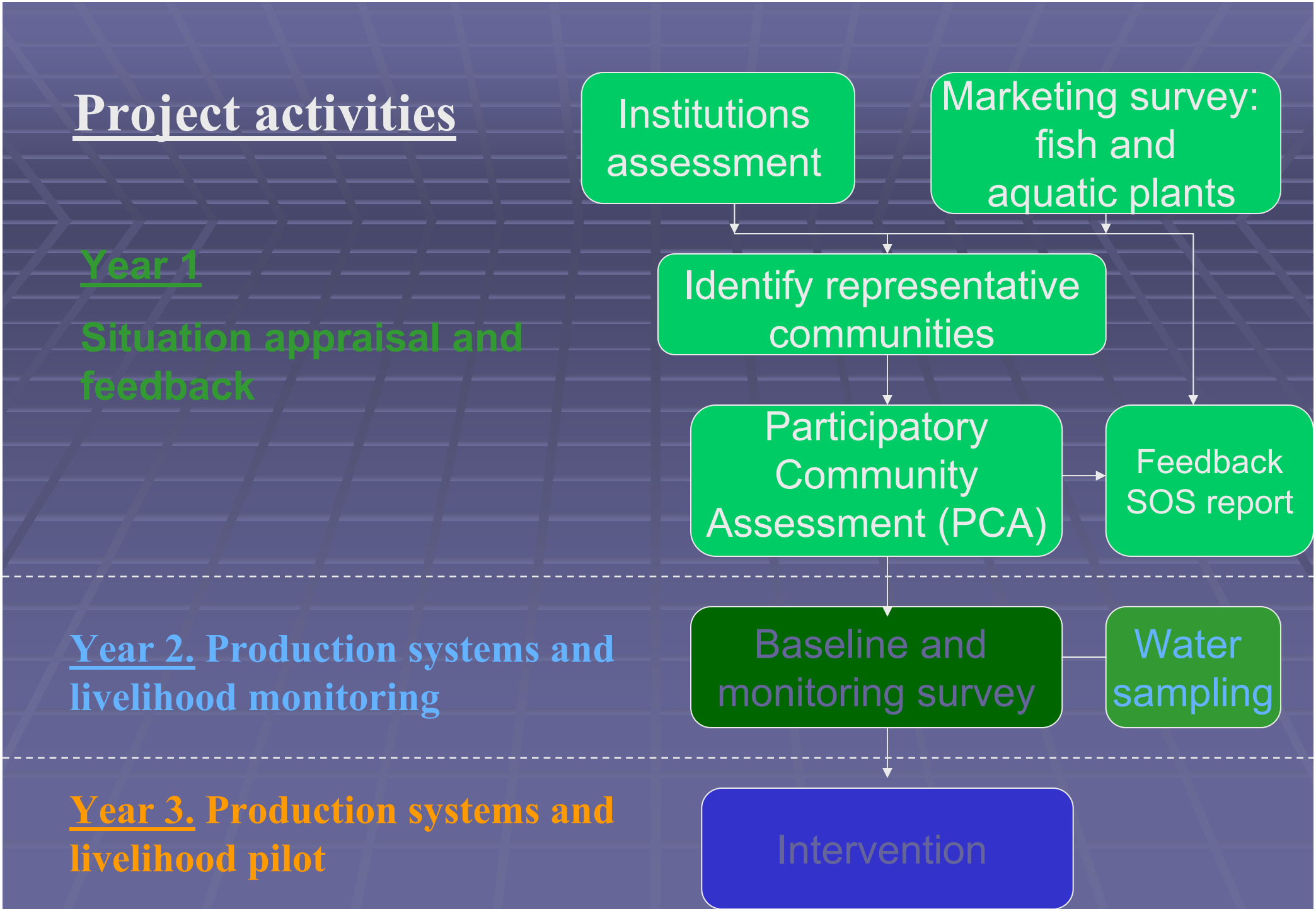
Project activities

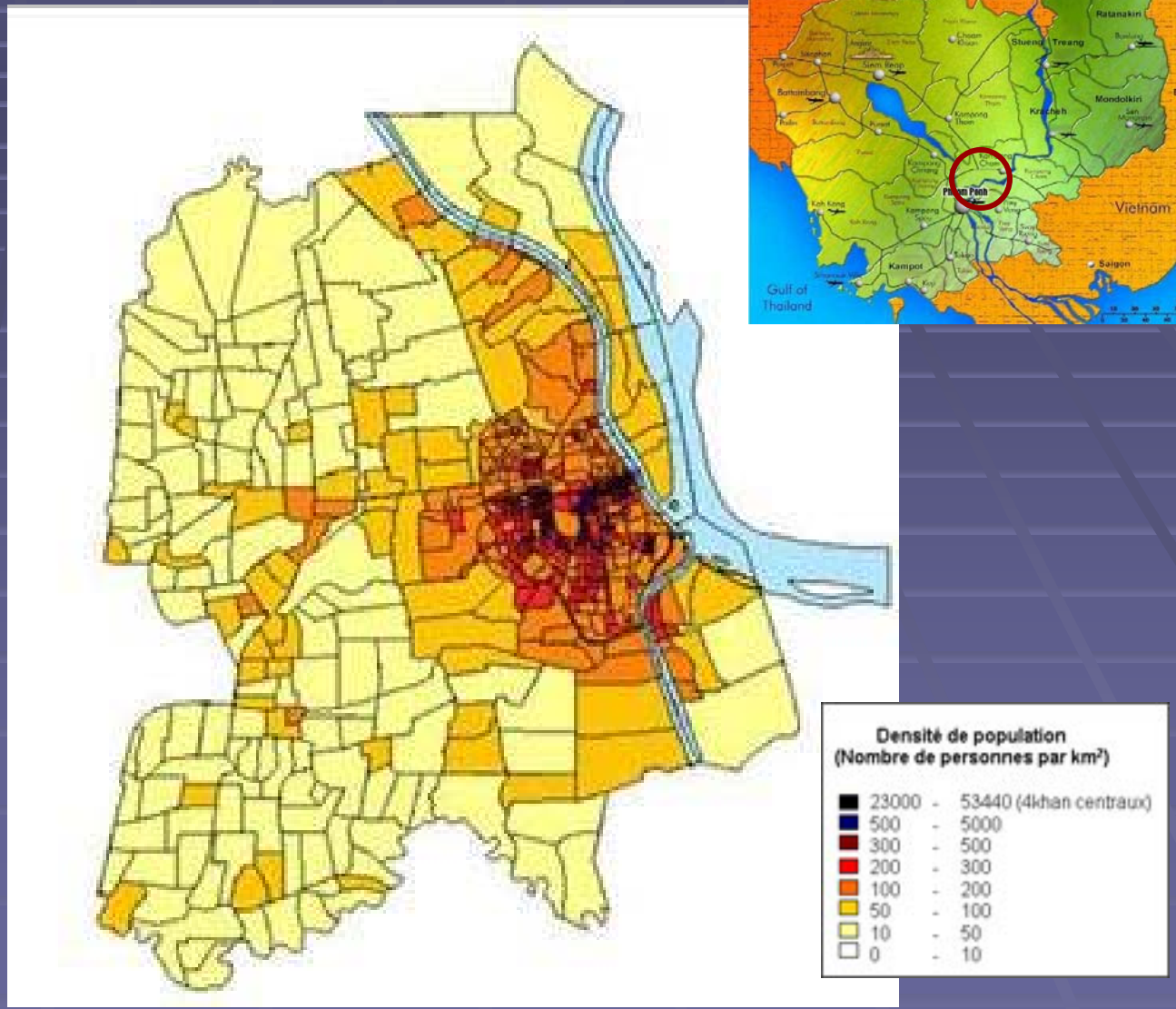


Background of Cambodia

- Cambodia is located in Southeast Asia
- Popul ation 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: 375km^2
- 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.

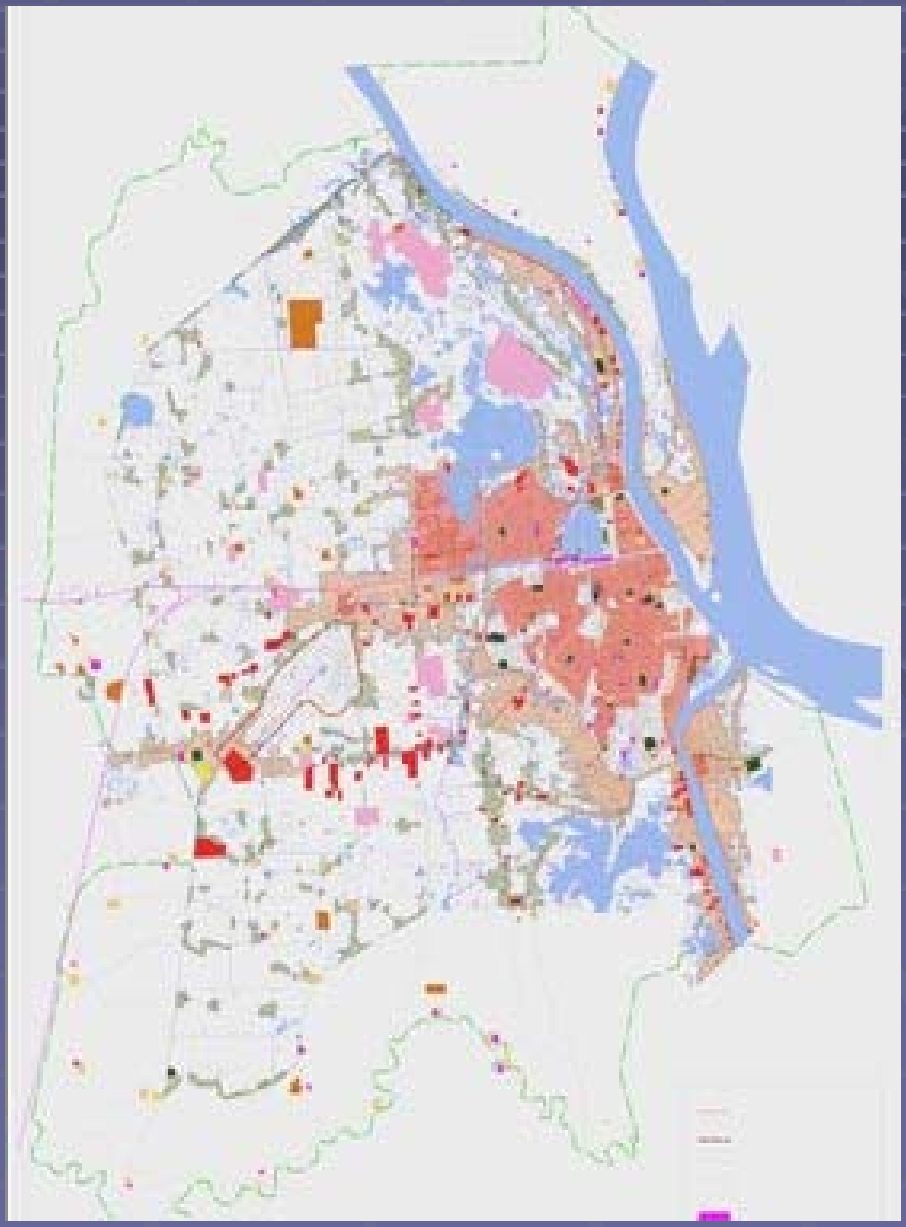


Background of Phnom Penh Cont.

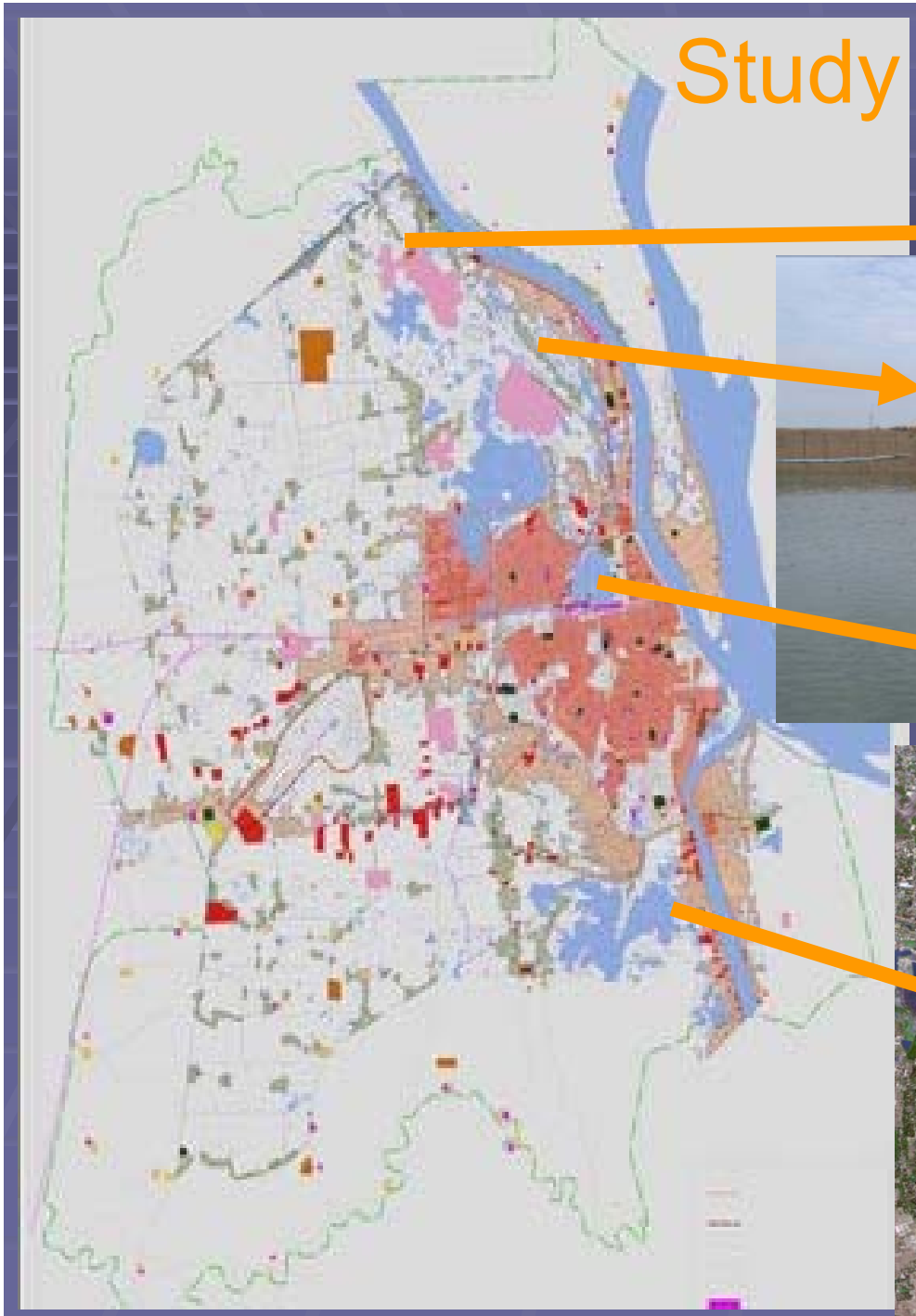
- City Surrounded by many swamps and lakes
- 80% natural lake and agriculture.
- Medium density : 130 p/ha (500p/ha in the centre and 50 p/ha in the suburb.)

- 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**.



Study Sites



Duong village

Muoy village

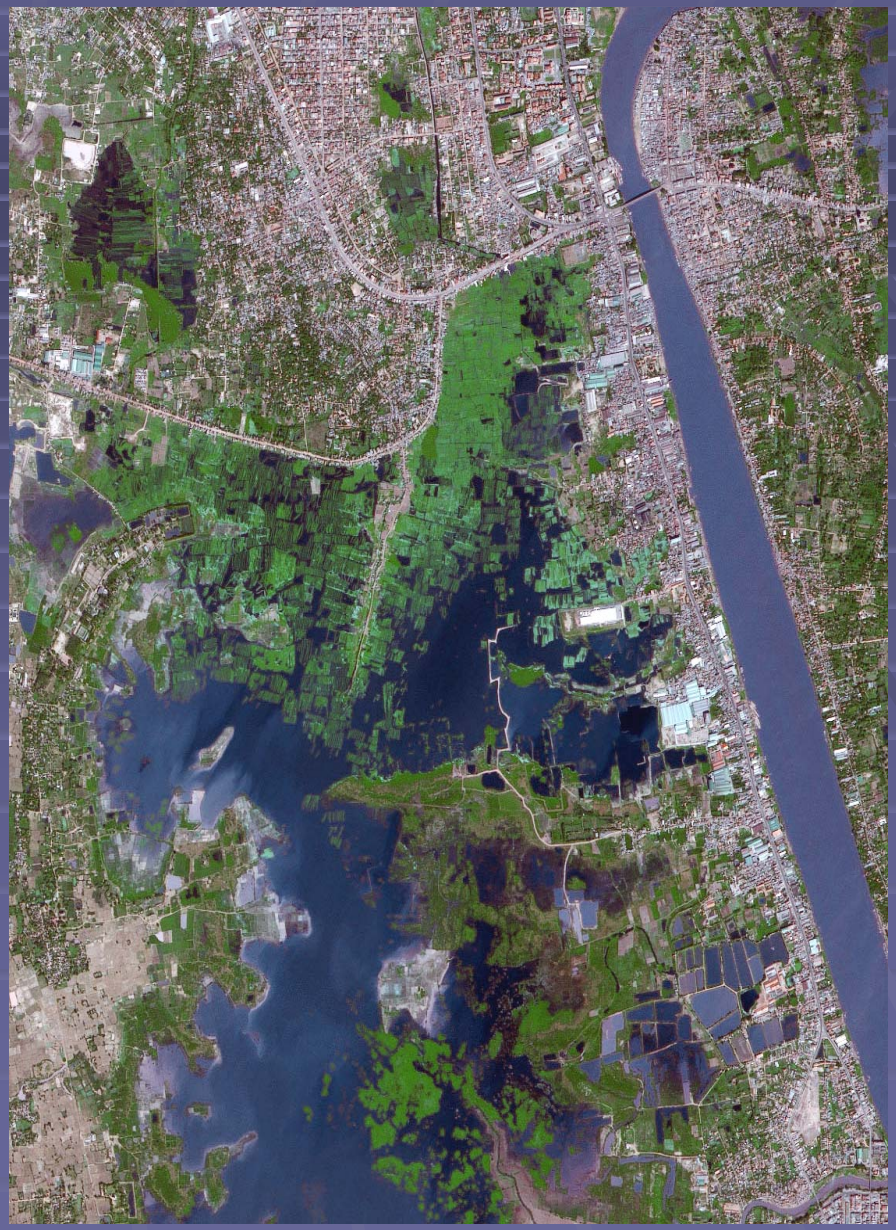
Kbal Tom Nub and
Tnout Chrum villages

Improvement of urban drainage and flood control system by JICA

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).

Fish Culture

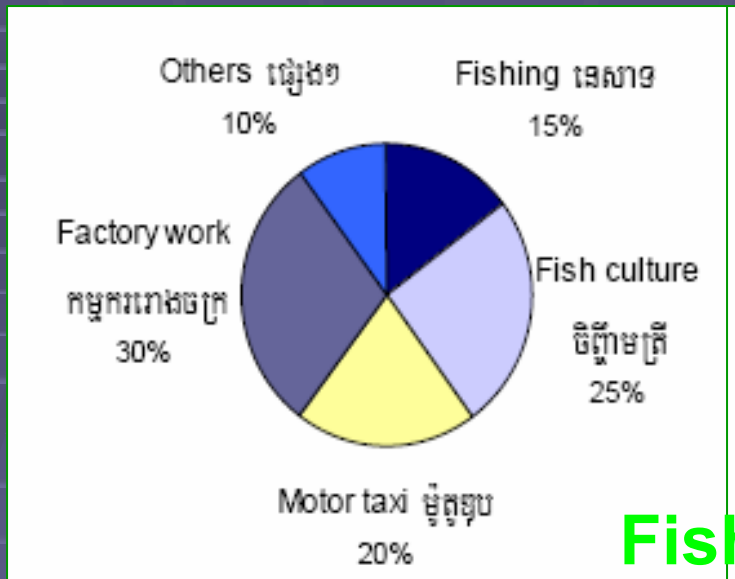
- **Muoy village** is more towards the centre of the city.
- 20-30 households produce **Pangasius** in net pen enclosures under their houses.
- Many kinds of fish feed are used e.g. rice bran, livestock and human waste, etc.
- Antibiotics are also mixed to the feed when their fish get diseases.

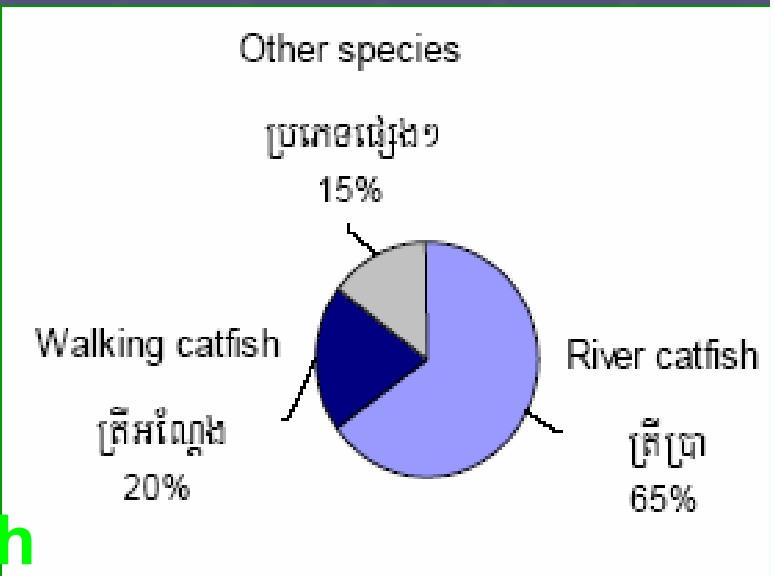
Fish Culture (Cont.)

- **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.

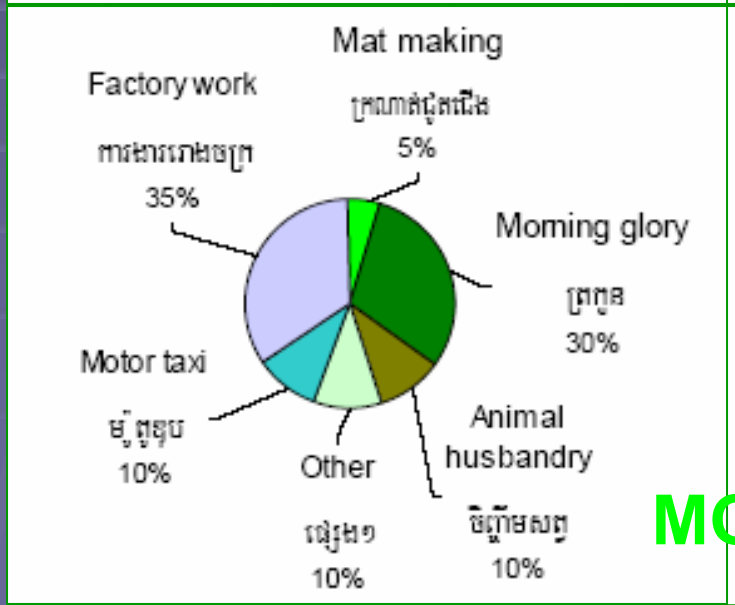
Livelihood diversity

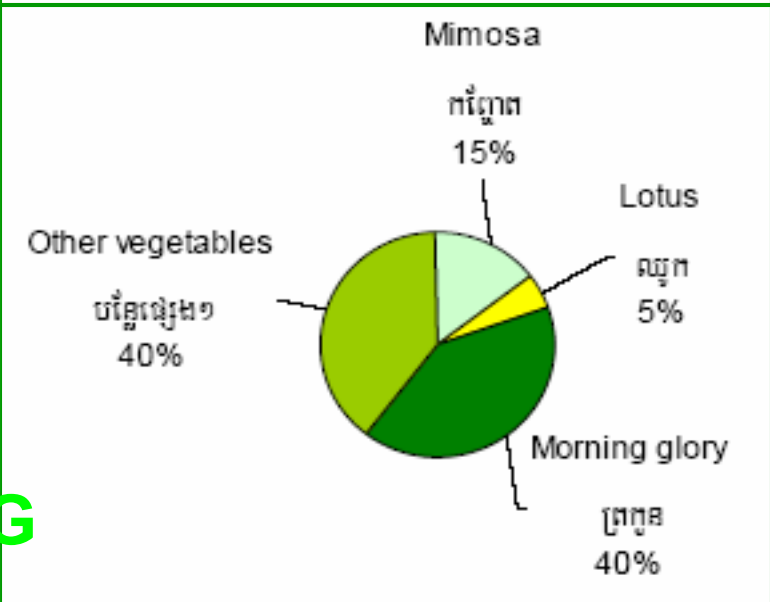
In the communities in which aquatic vegetables and fish are important, livelihoods are very diversified





Fish





MG

Photos taken during PCA activities in 4 sites

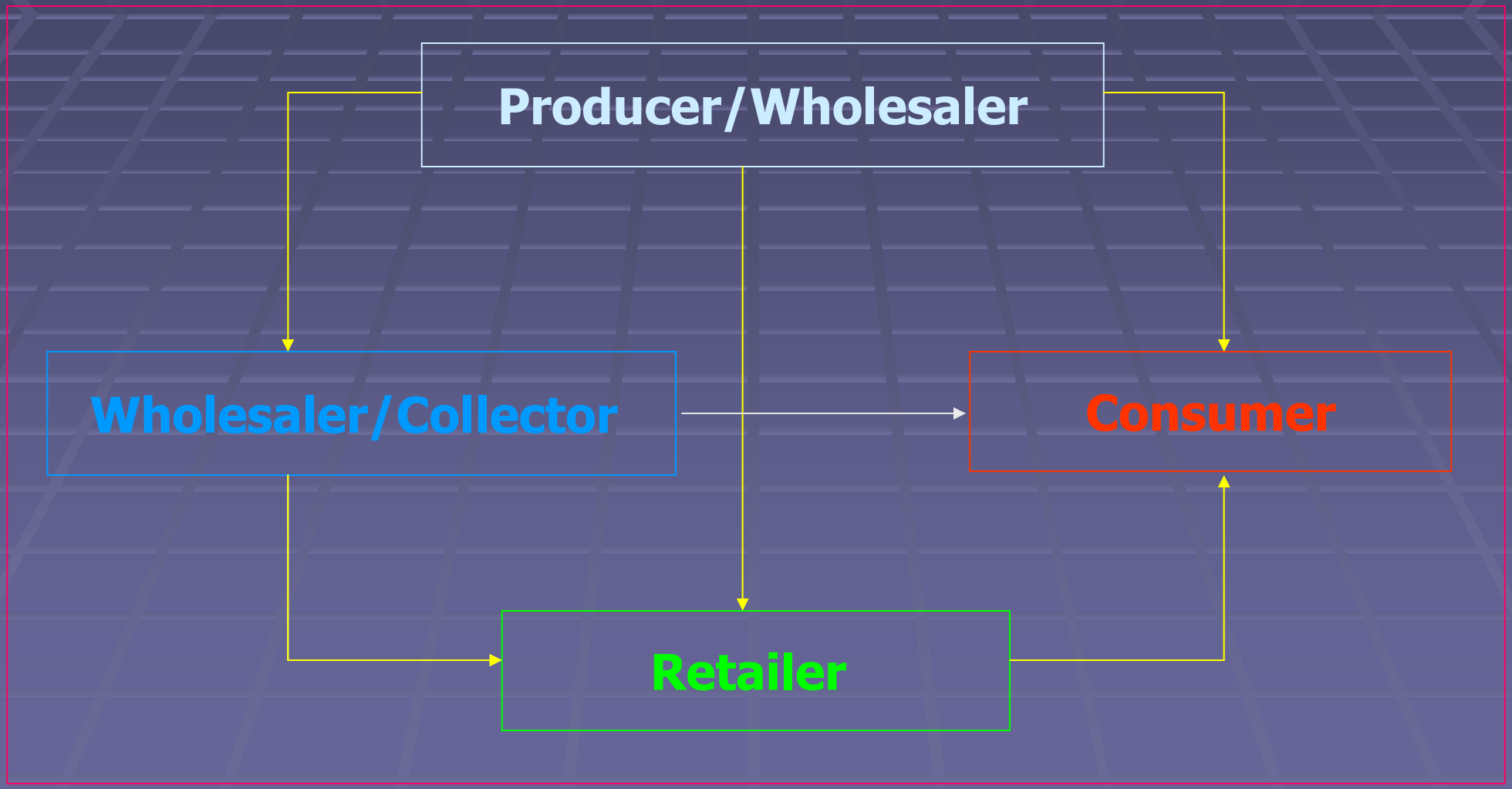
"Artist at work!"

Presenting the findings

Community Mapping

Group Discussion

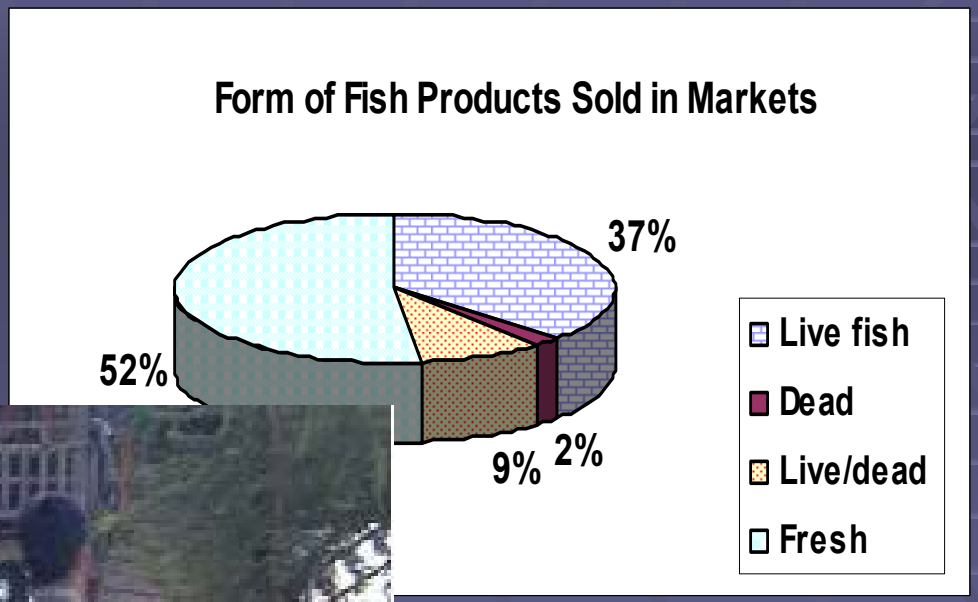
Market Channels

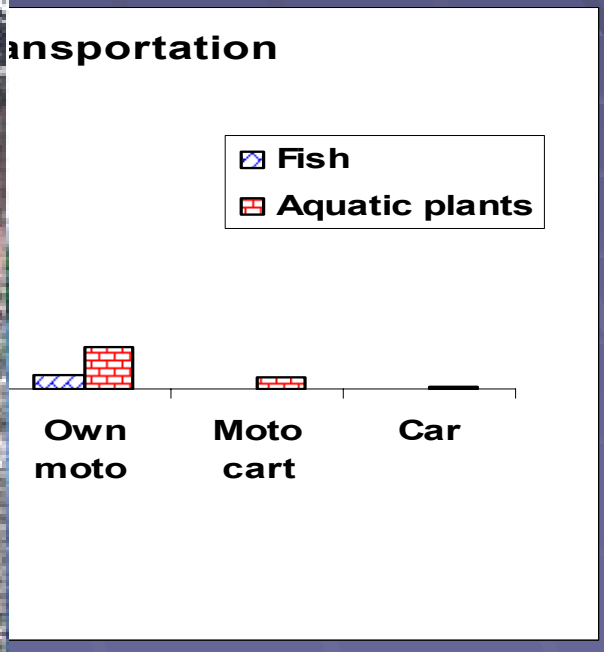


Markets Survey

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

- Major transportation f aquatic plants and fish motorcycle-taxi





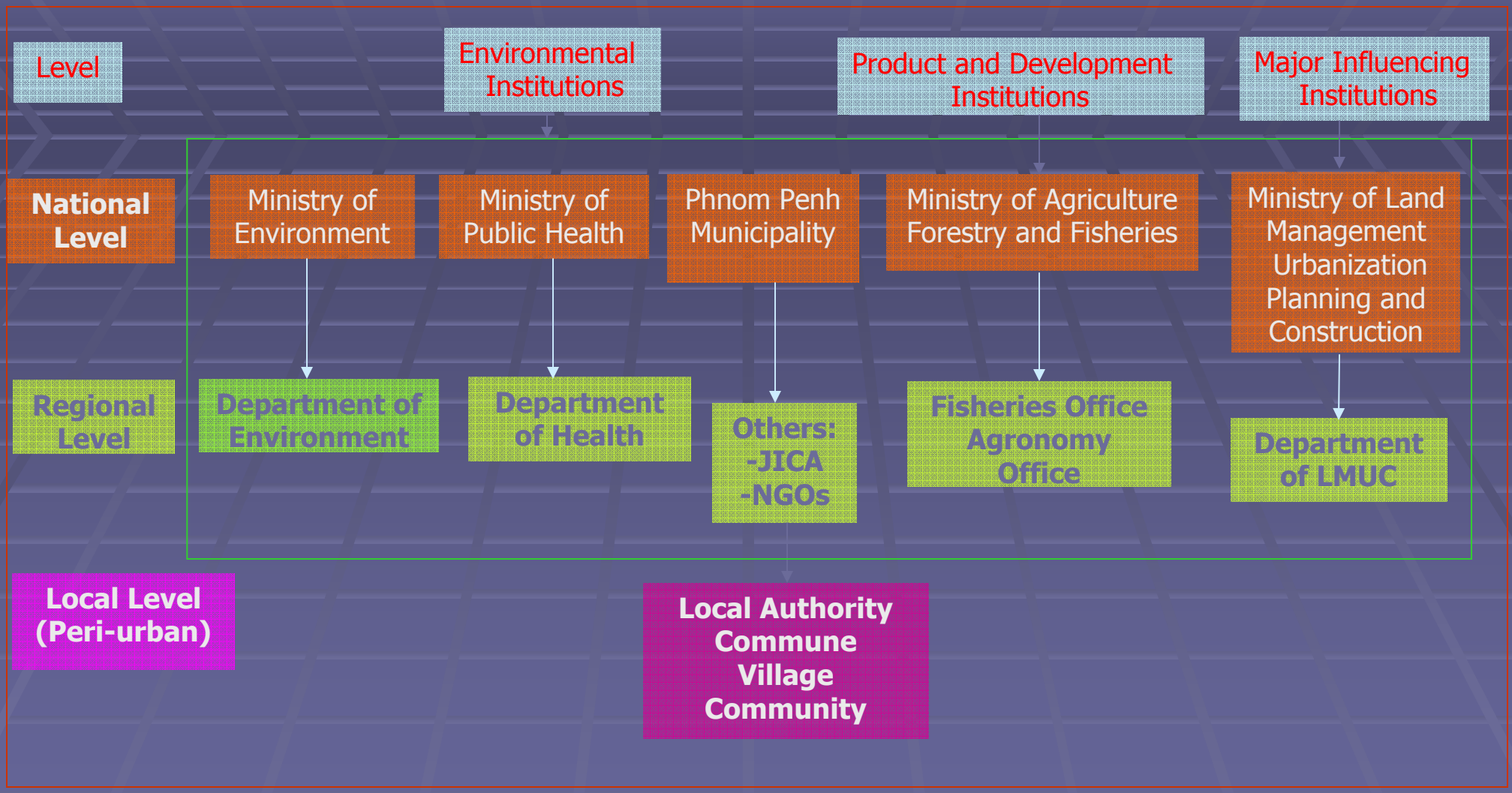
Markets Survey

- **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 woman play 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 whole sale markets in PP
- Mimosa commands higher price than MG

Institutional Linkages



State Of the System Meeting (SOS)
December 2003, RUA, Phnom Penh

- 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

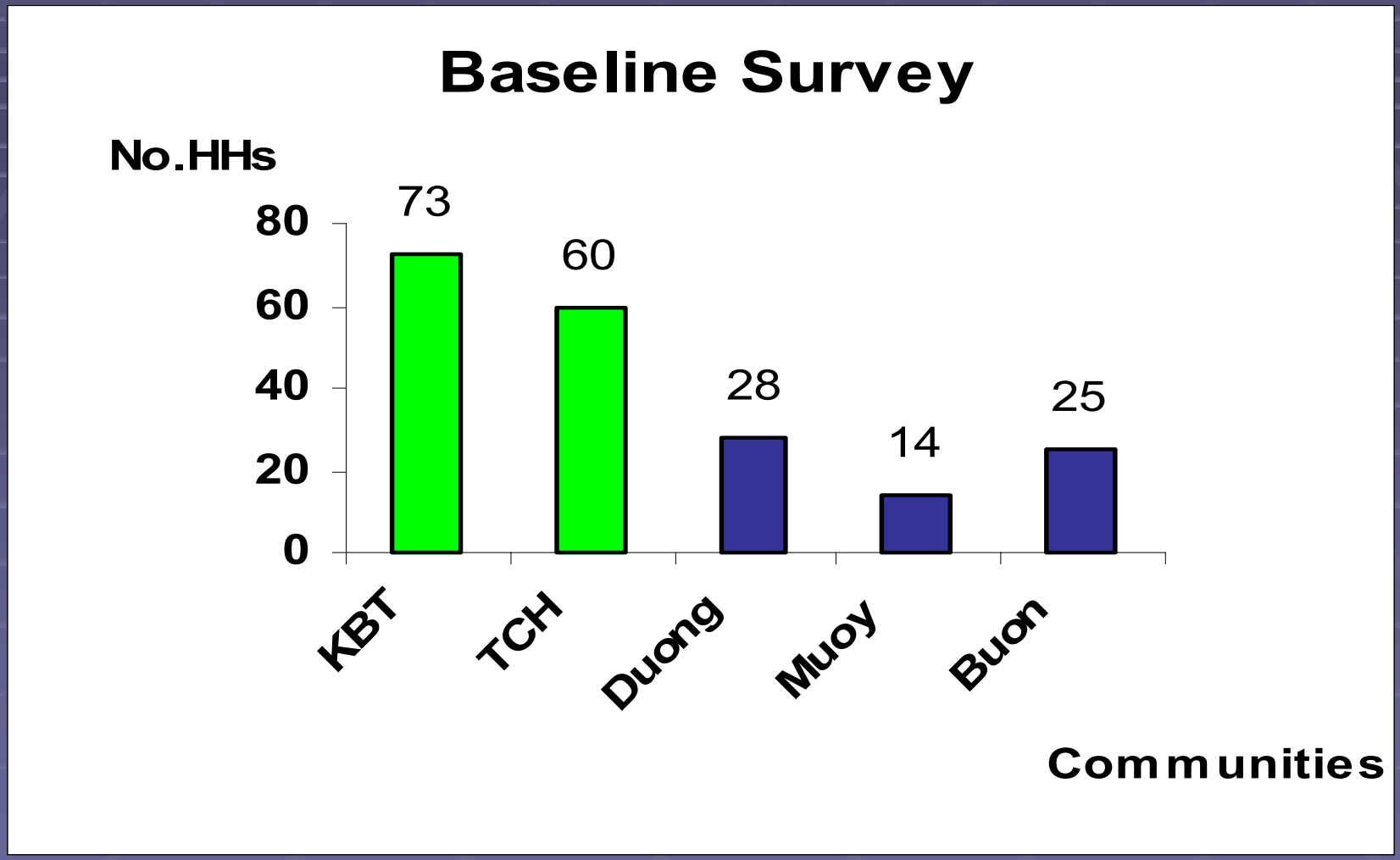
1. Oversupply
2. Inappropriate place for selling aquatic product
3. High price of gasoline
4. Instability of aquatic product price
5. Lack of technique for product preservation

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

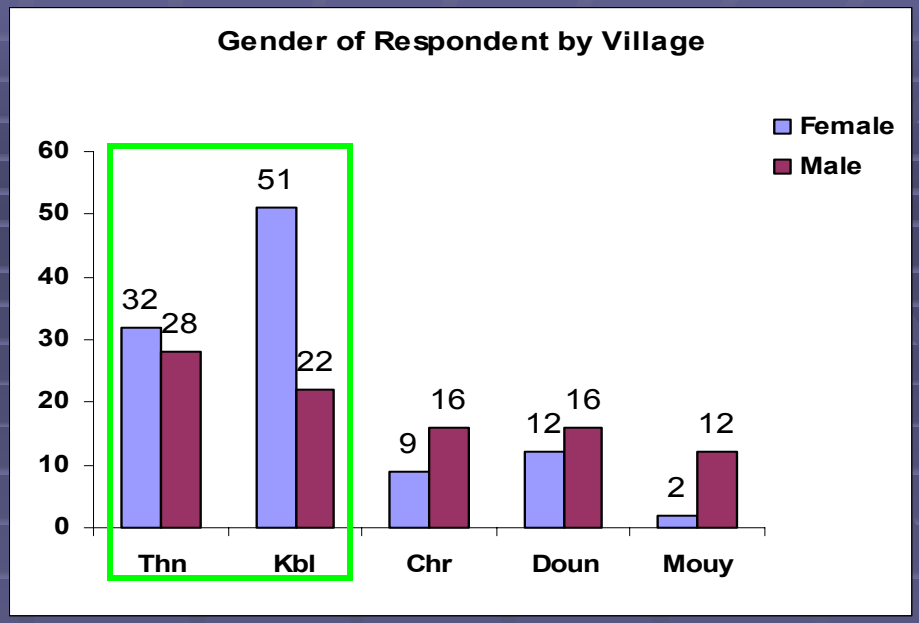
Household Baseline Survey May - July2003



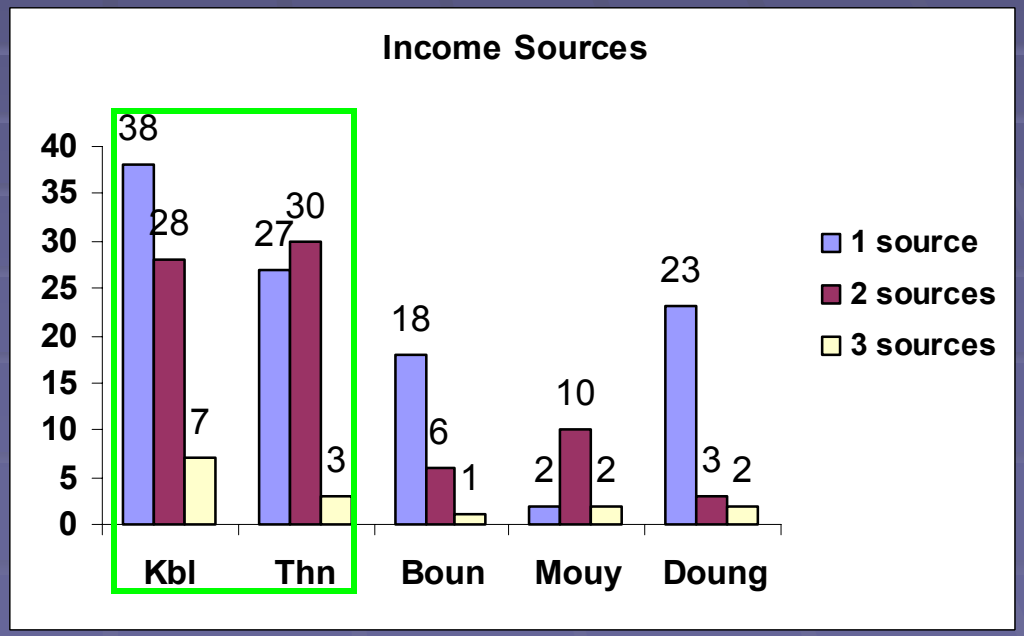
Baseline Survey Result

Gender of Respondents and Income Source

- Respondents are women more than men in Aquatic Area

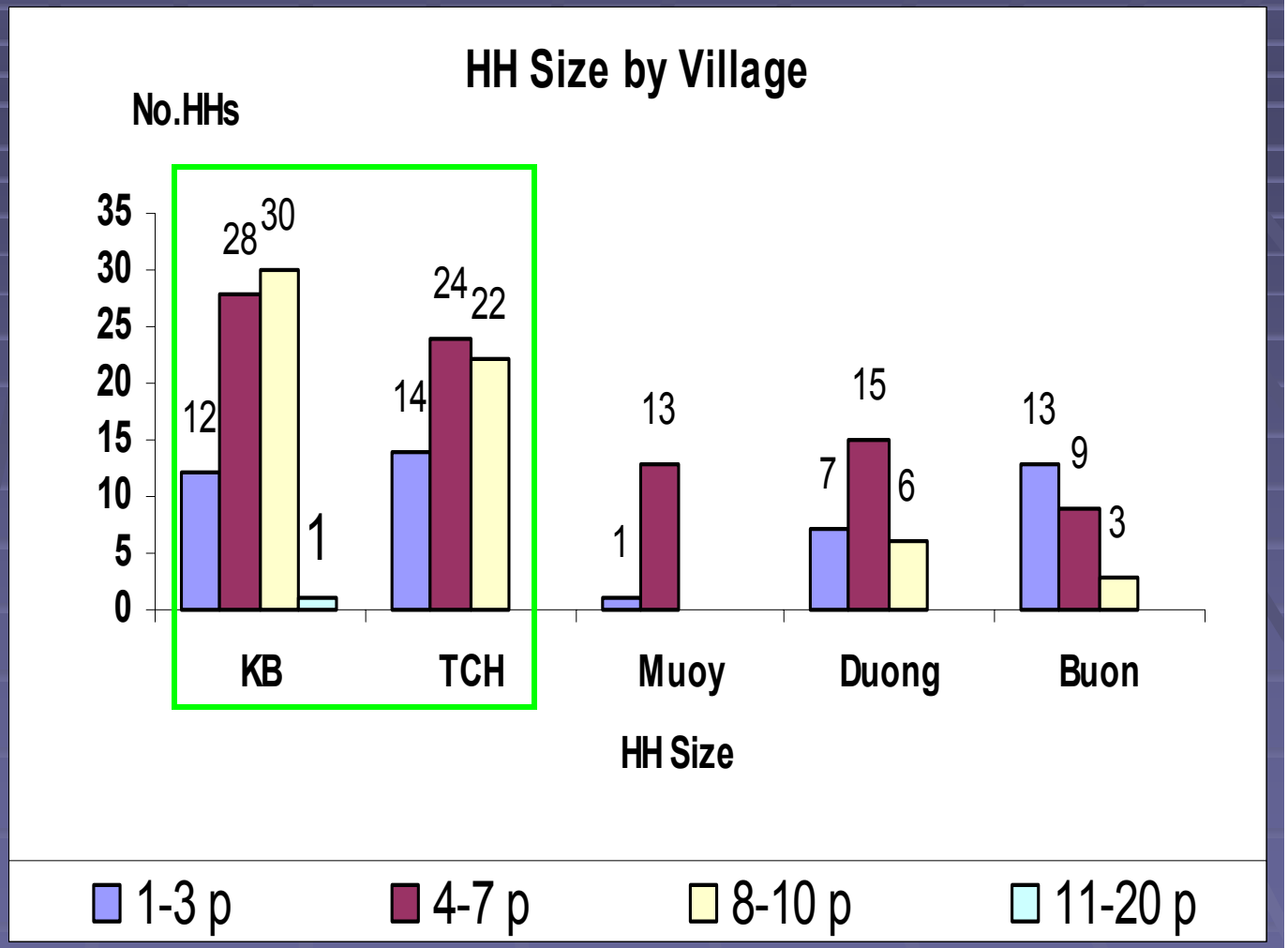


-HHs in Aquatic vegetable production have more income sources than fish culture



Households Size by Village

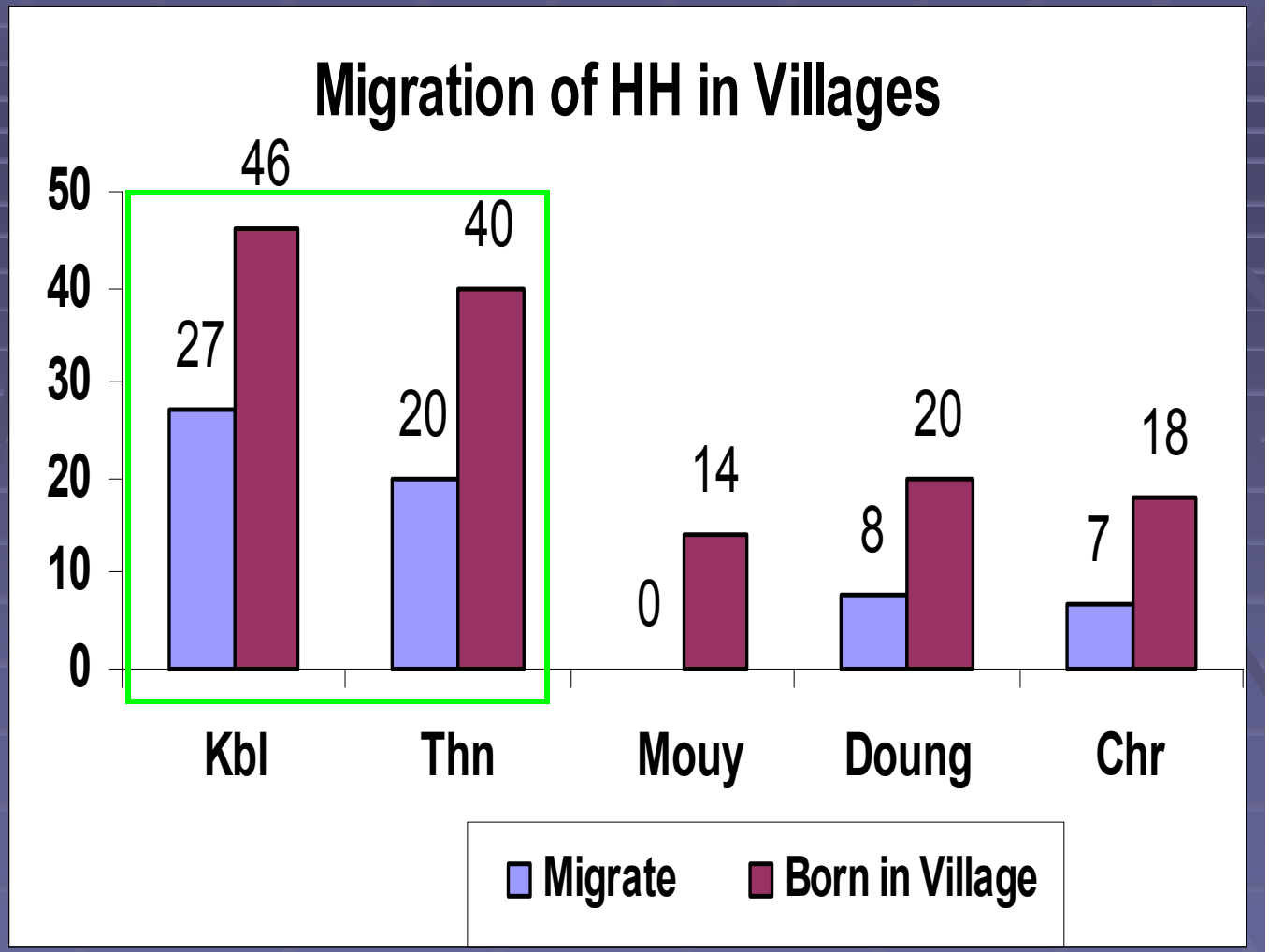
- MG HHs generally have larger number of members compared to fish culture



Migration by Village

-Most of HHs born in their village

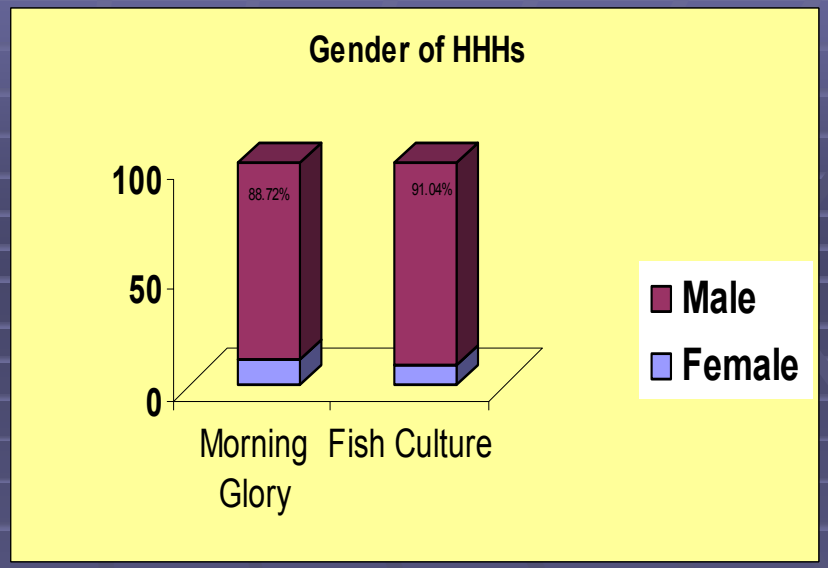
-Many migrate from other provinces for business reason



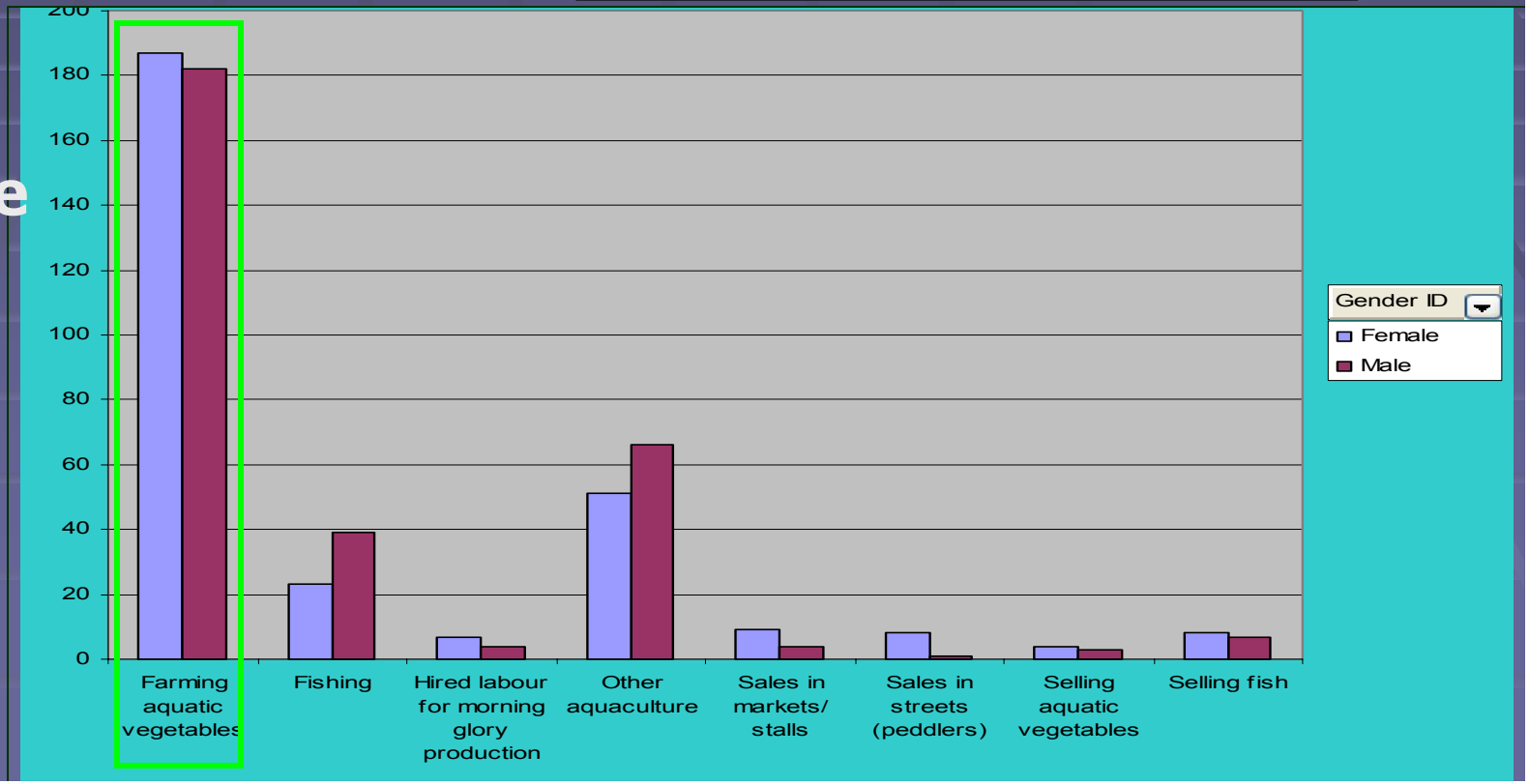
% Gender of HHs Head by Production system

- Most of the HHHs are men roughly 80-90%,

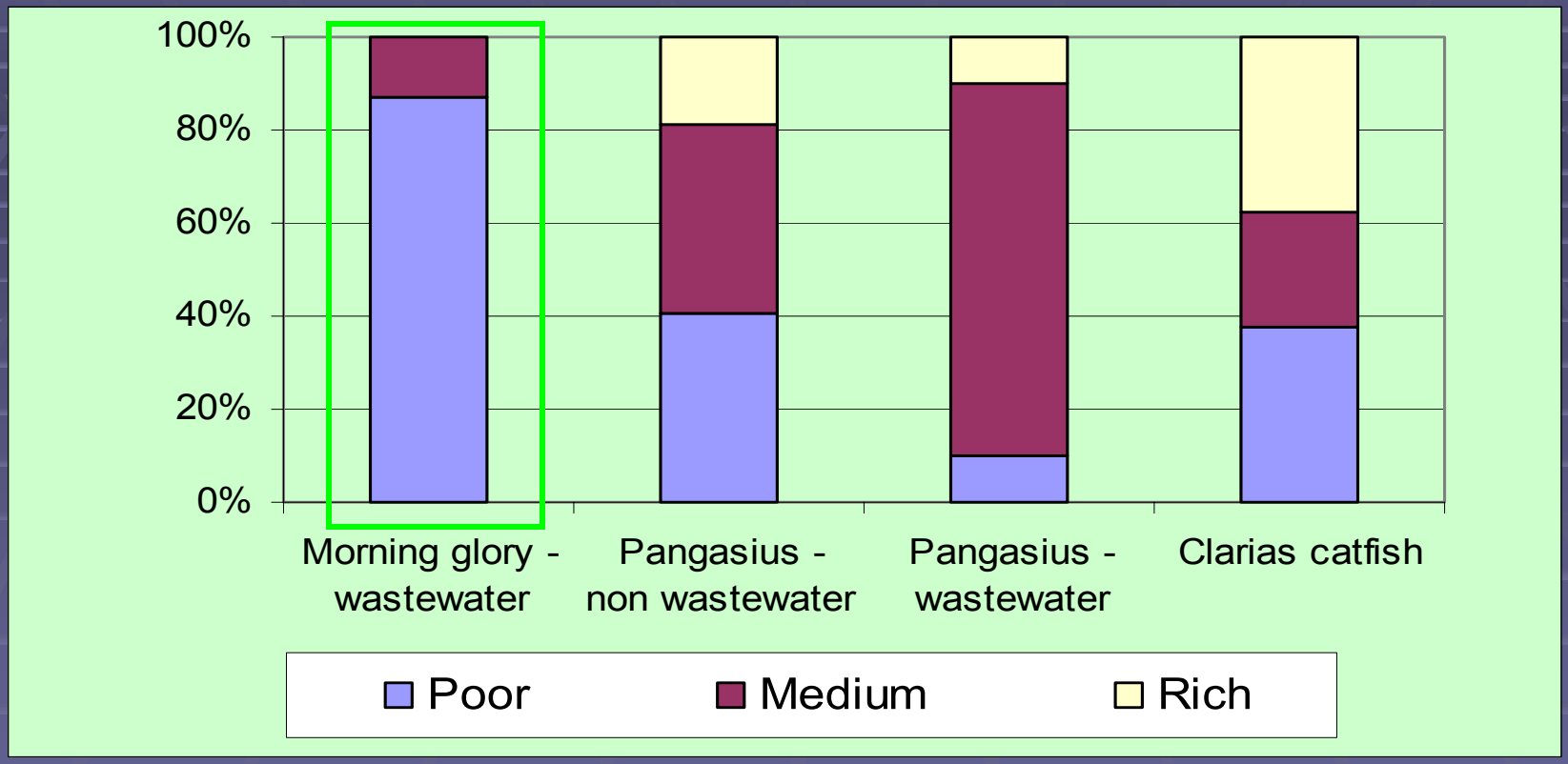
- Morning Glory community have higher Woman HHHs (widows) than fish



- Female more involved in Aquatic plant while men in fish



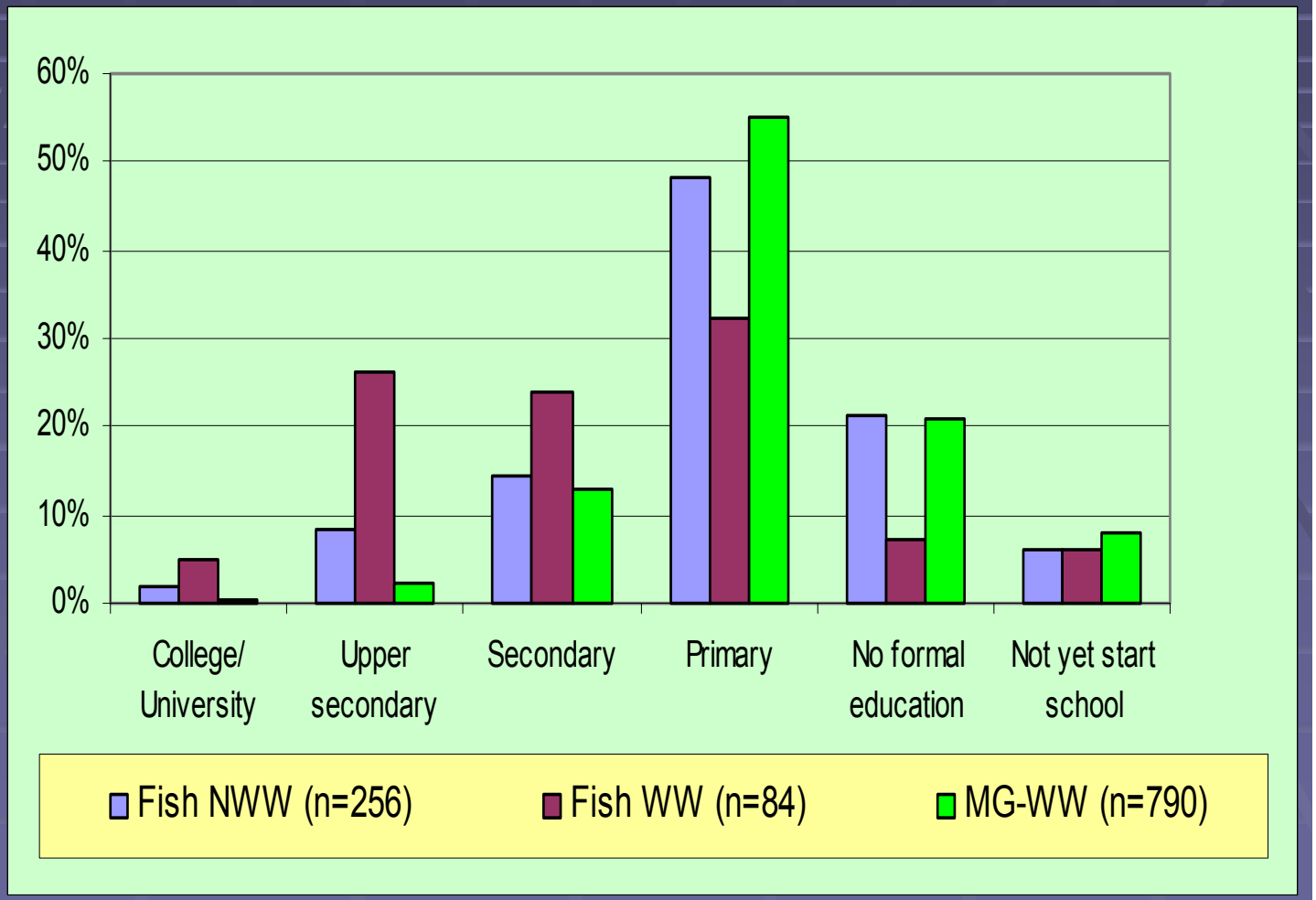
% Wealth Ranking by Production System



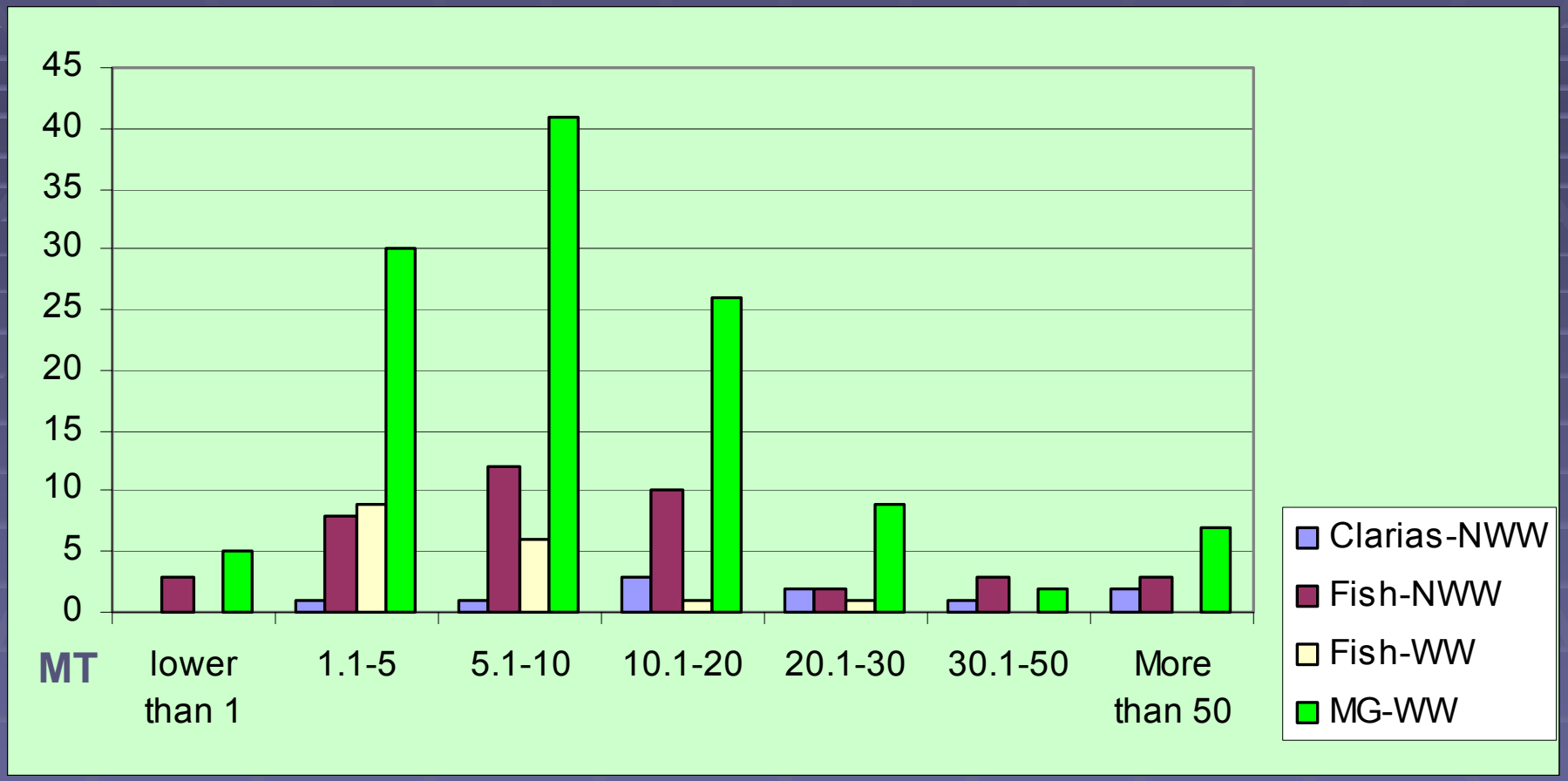
- Clarias Catfish well distribute in wealth ranking
- Morning Glory ranked poor to medium (no rich)
- Fish NWW and MG have more poor than Fish WW (implied Central and Peri-Urban)

% 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

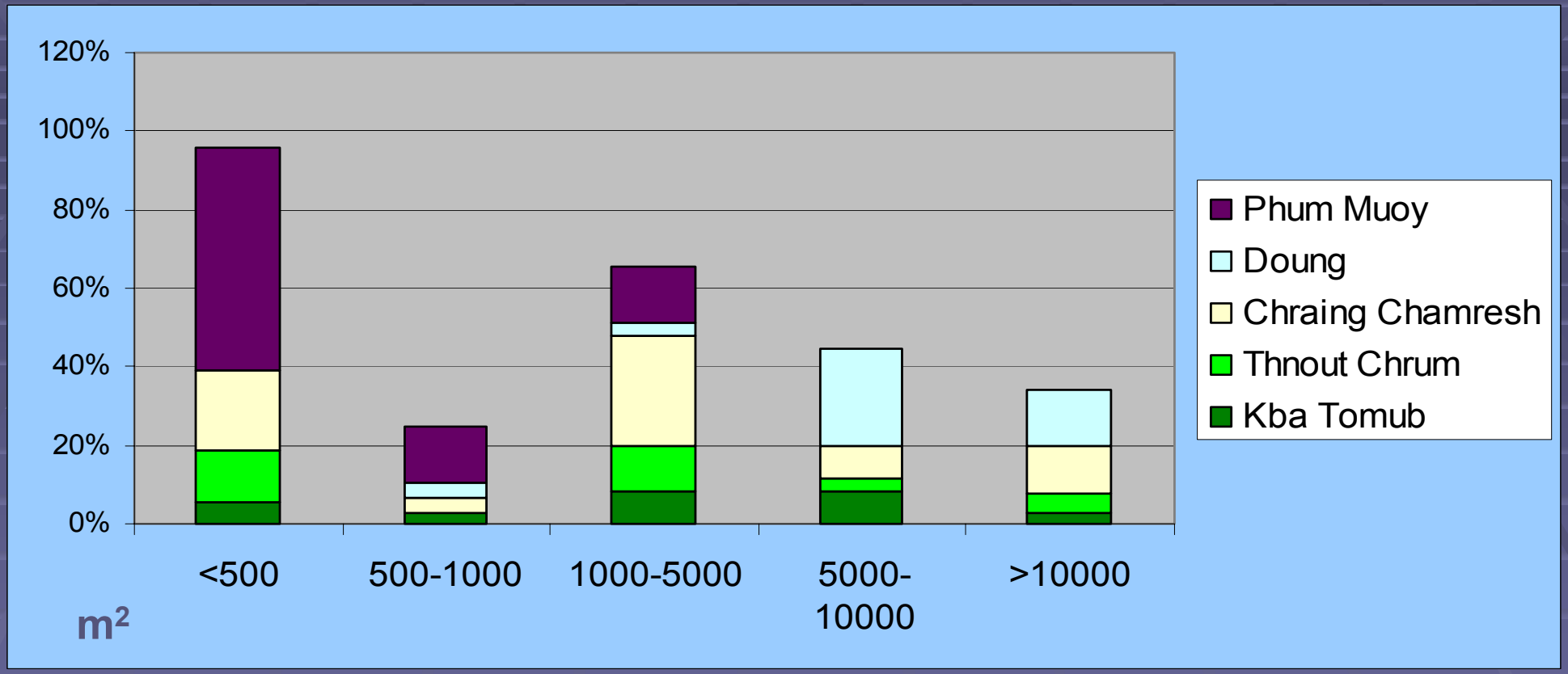


Annual Yield by Production System (MT)



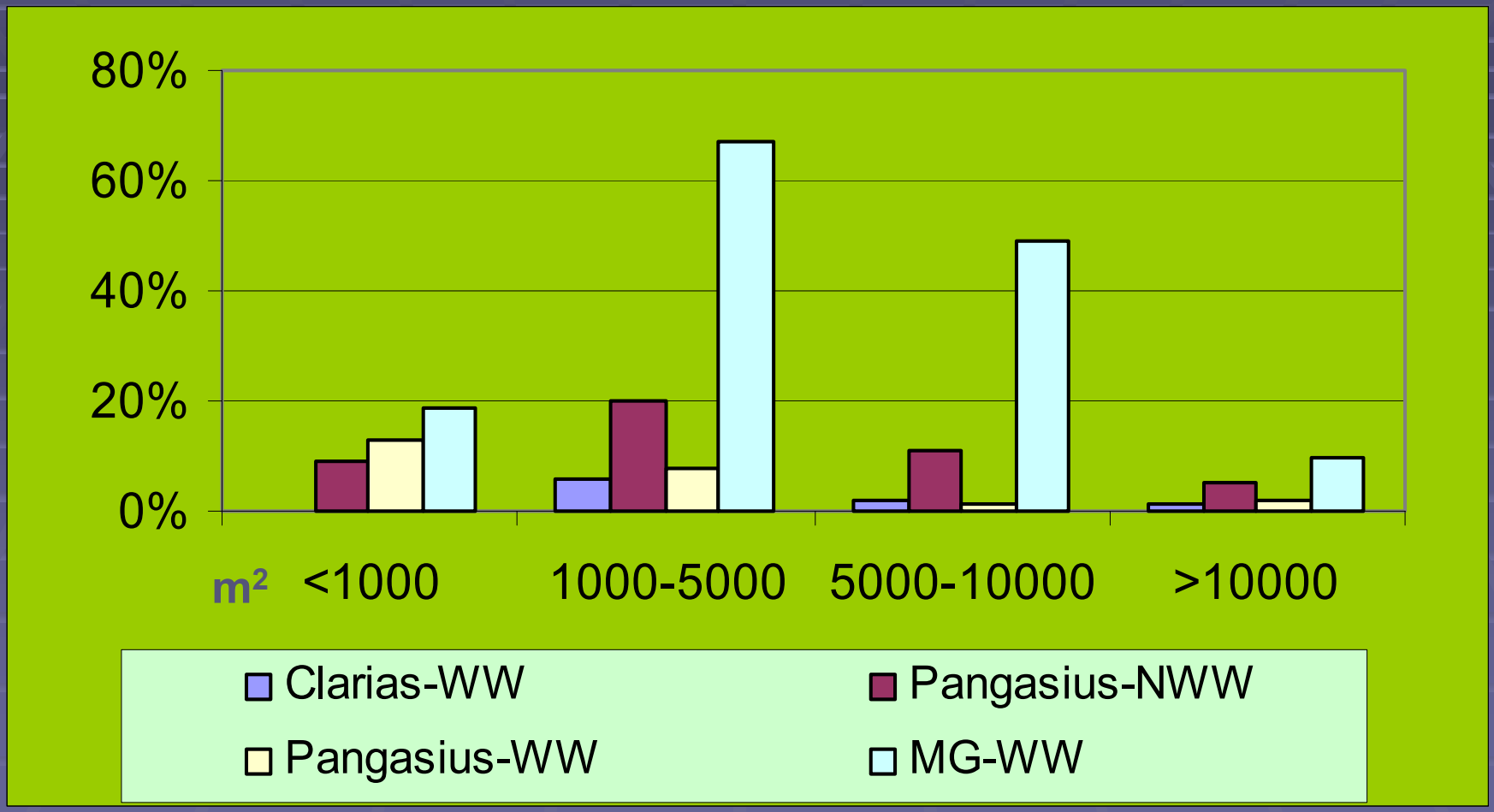
- MG-WW produce higher yield than fish farming
- Fish-NWW produce higher yield than fish-WW

% Land ownership by village



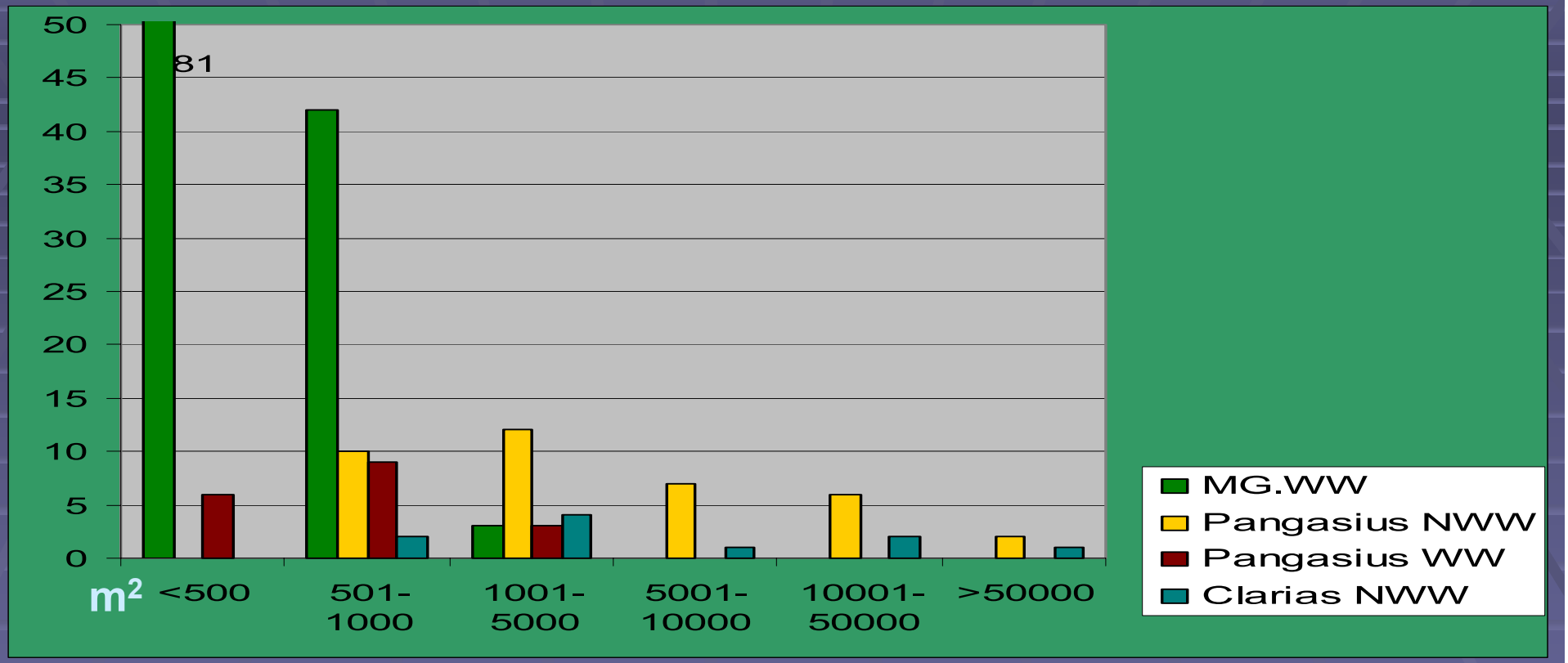
- High % own only house plots (Muov village -WW)
- Duong Village and Buon village (Fish) own bigger land plots
- Kbal Tomnub and Thnout Chrum (MG) own small plots

Land access right by production system



- More producers access land between 1000-5000 sq. meter

Gross Income level by Production System



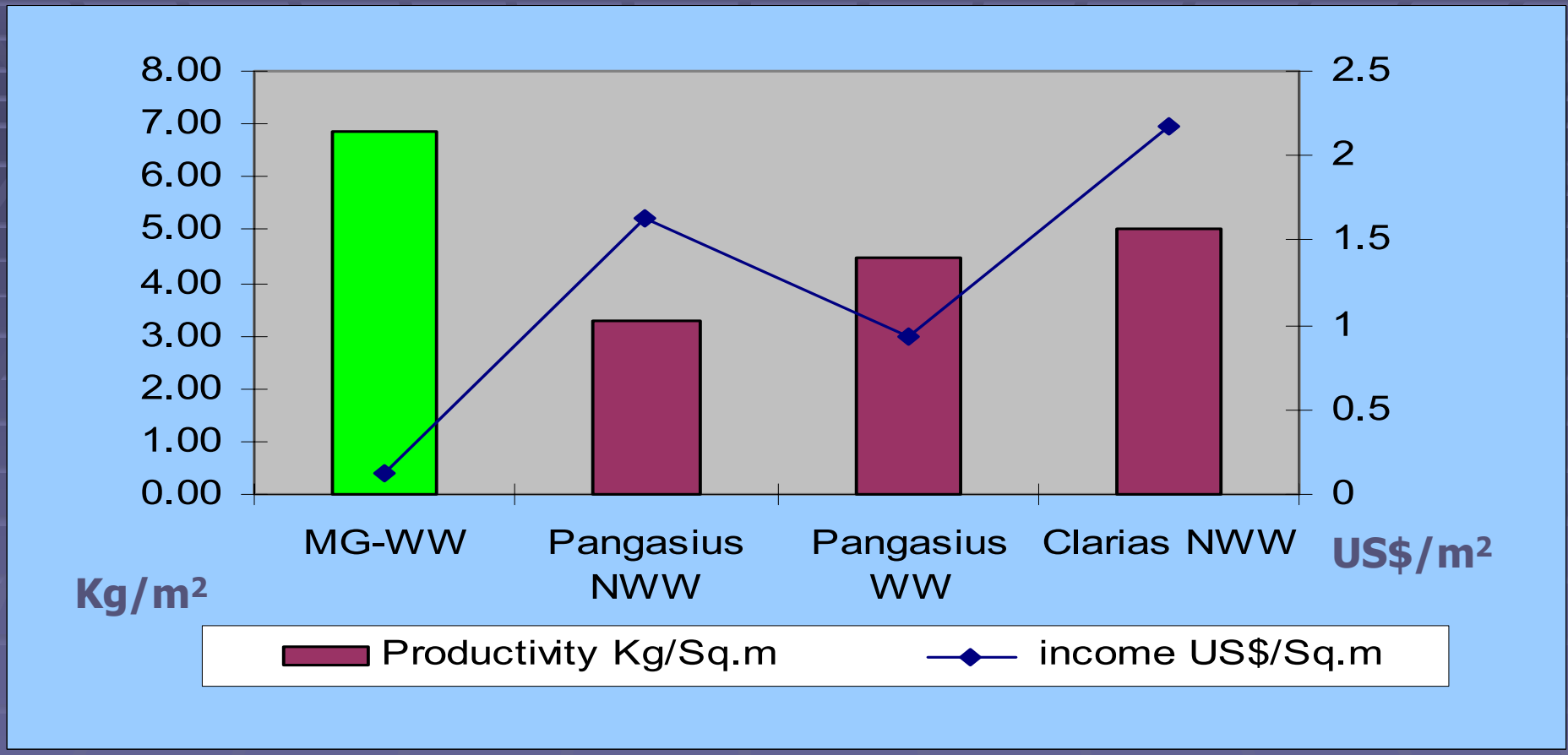
-MG is likely produce lowest income among others (<500 and 500-1000)

- 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)

Productivity by Production System

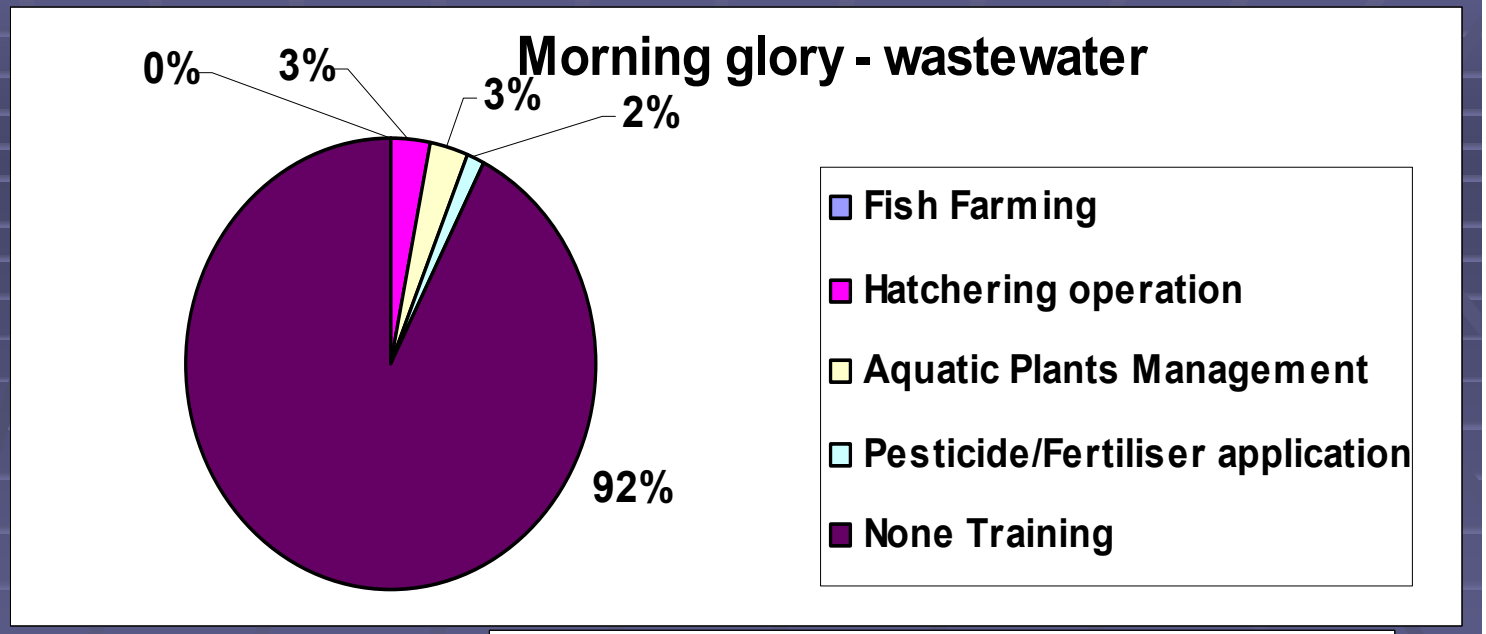


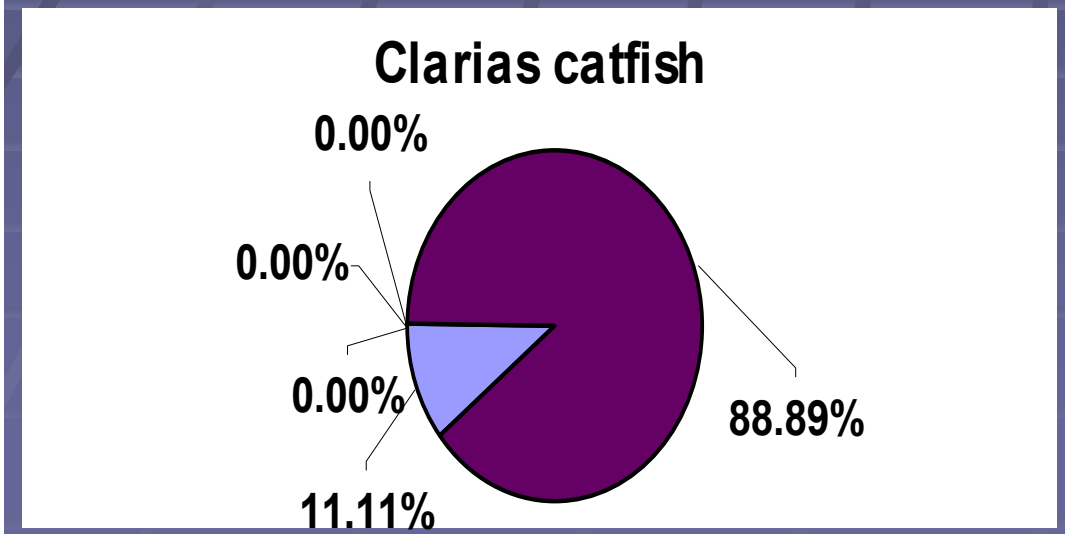
- MG gain highest productivity but lowest income

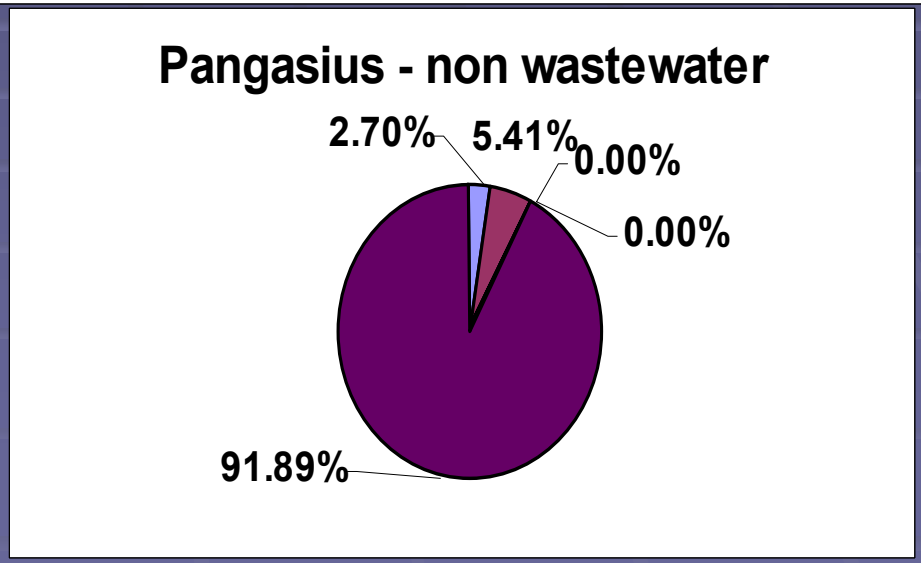
- Clarias rank the highest income followed by Pangasius NWW then Pangasius WW

AFPS training

- Both Fish and MG production got very few AFPS training

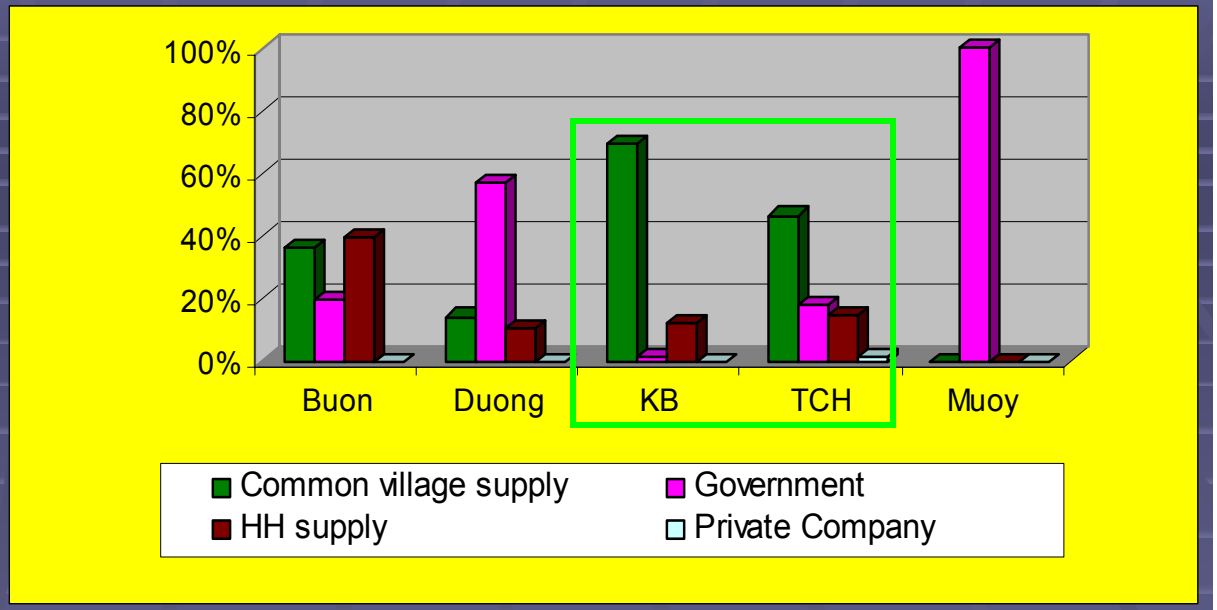




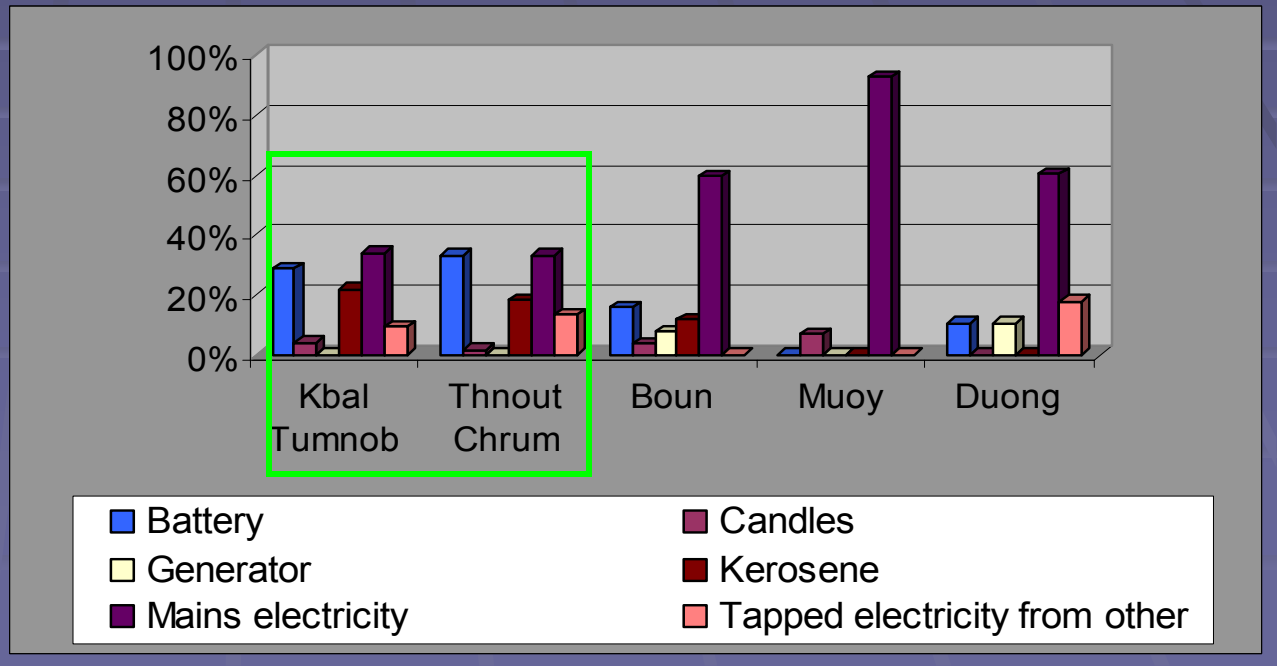


Water and Electricity Supplier by Village

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

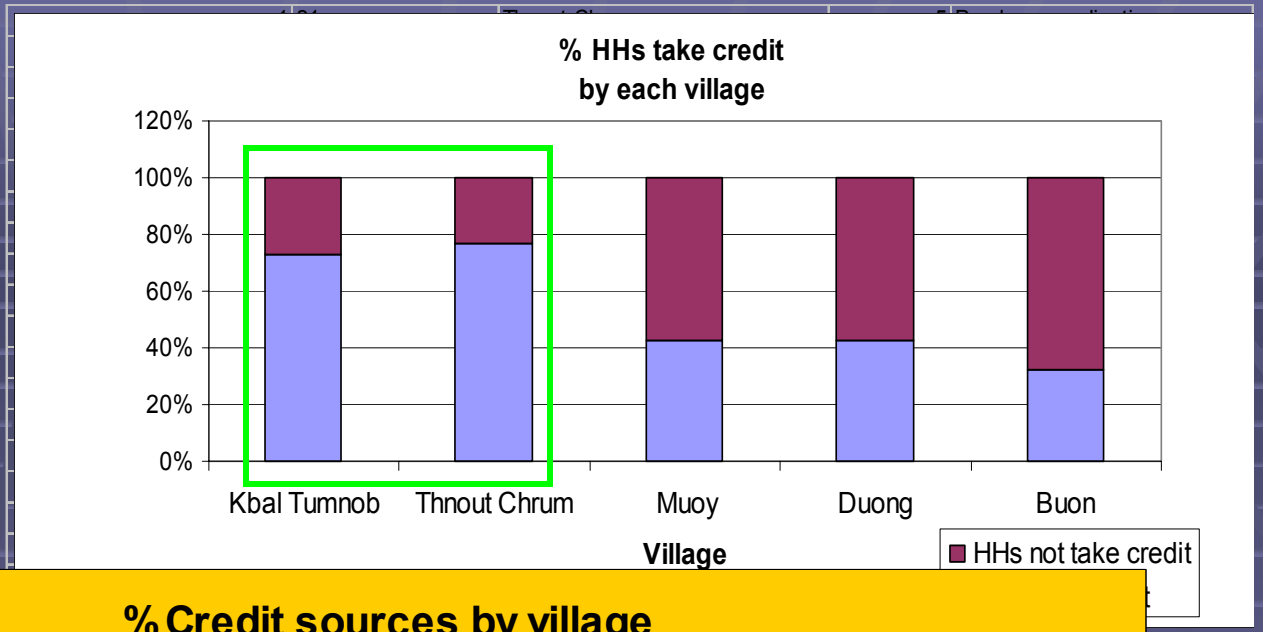


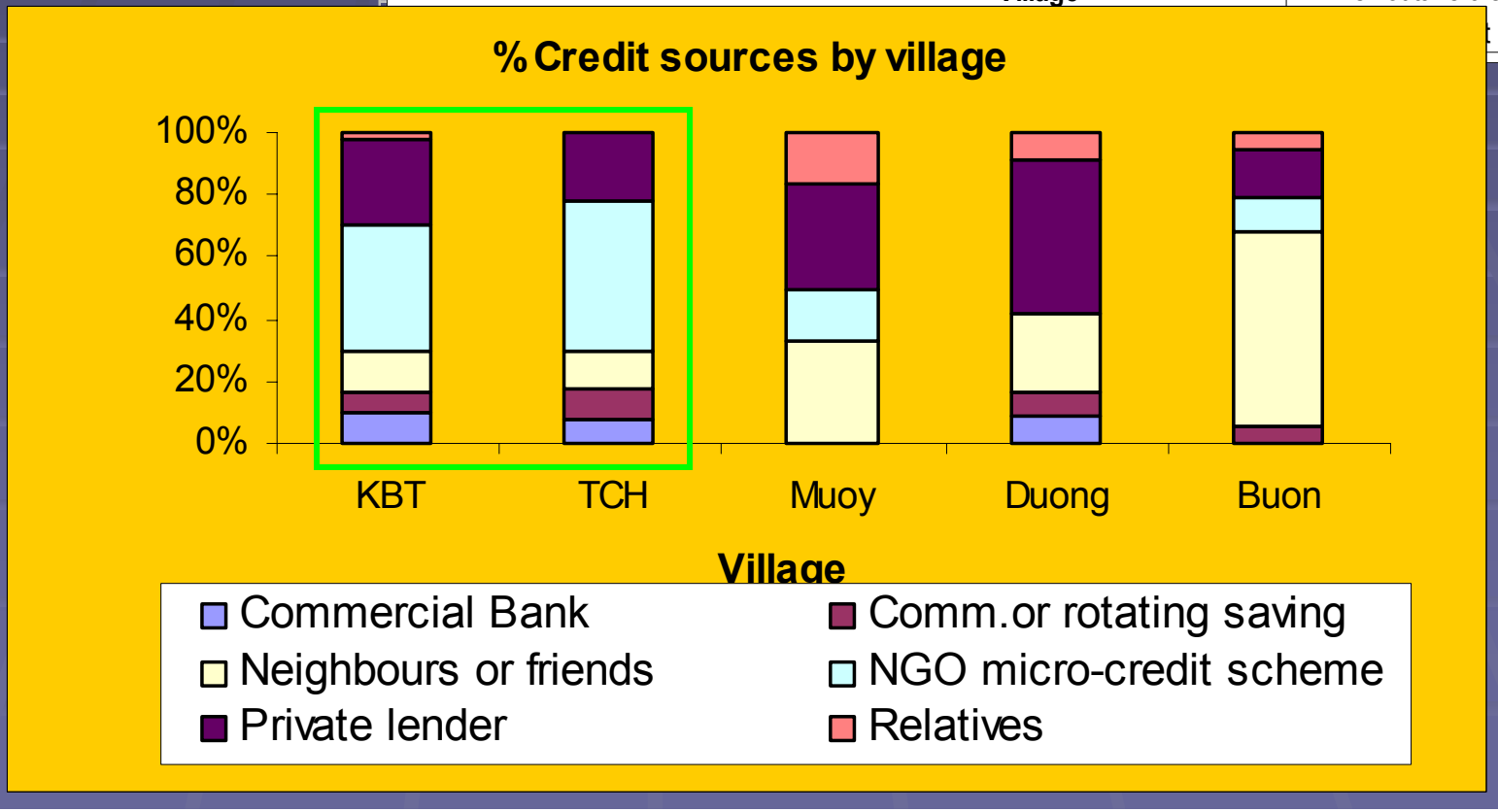
-Generators for electricity used in Buon and Duong village



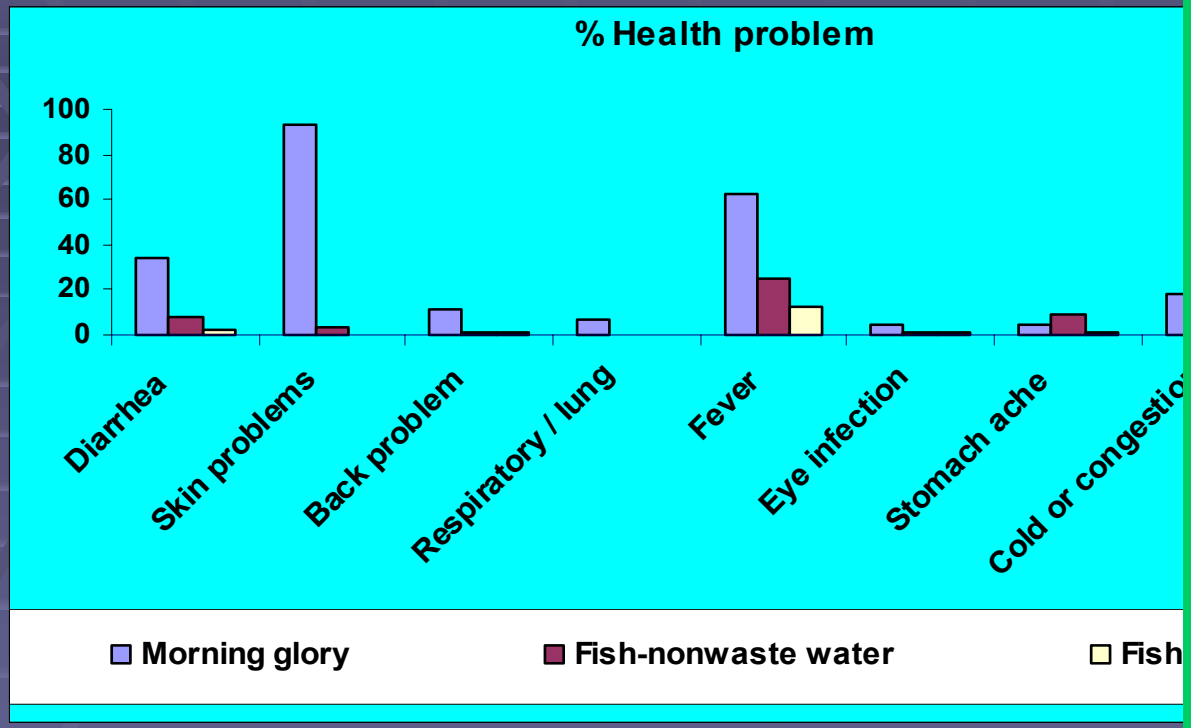
Credit Sources

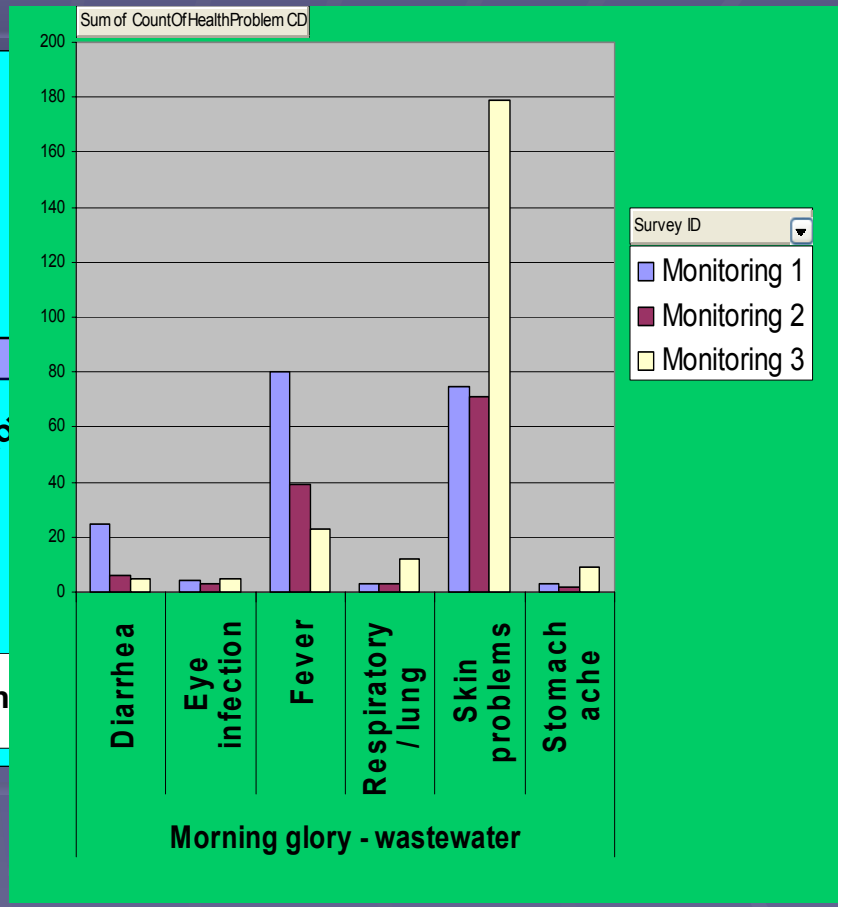
- More %HHs in MG production take credit more than fish do





Health Problem of aquatic producers

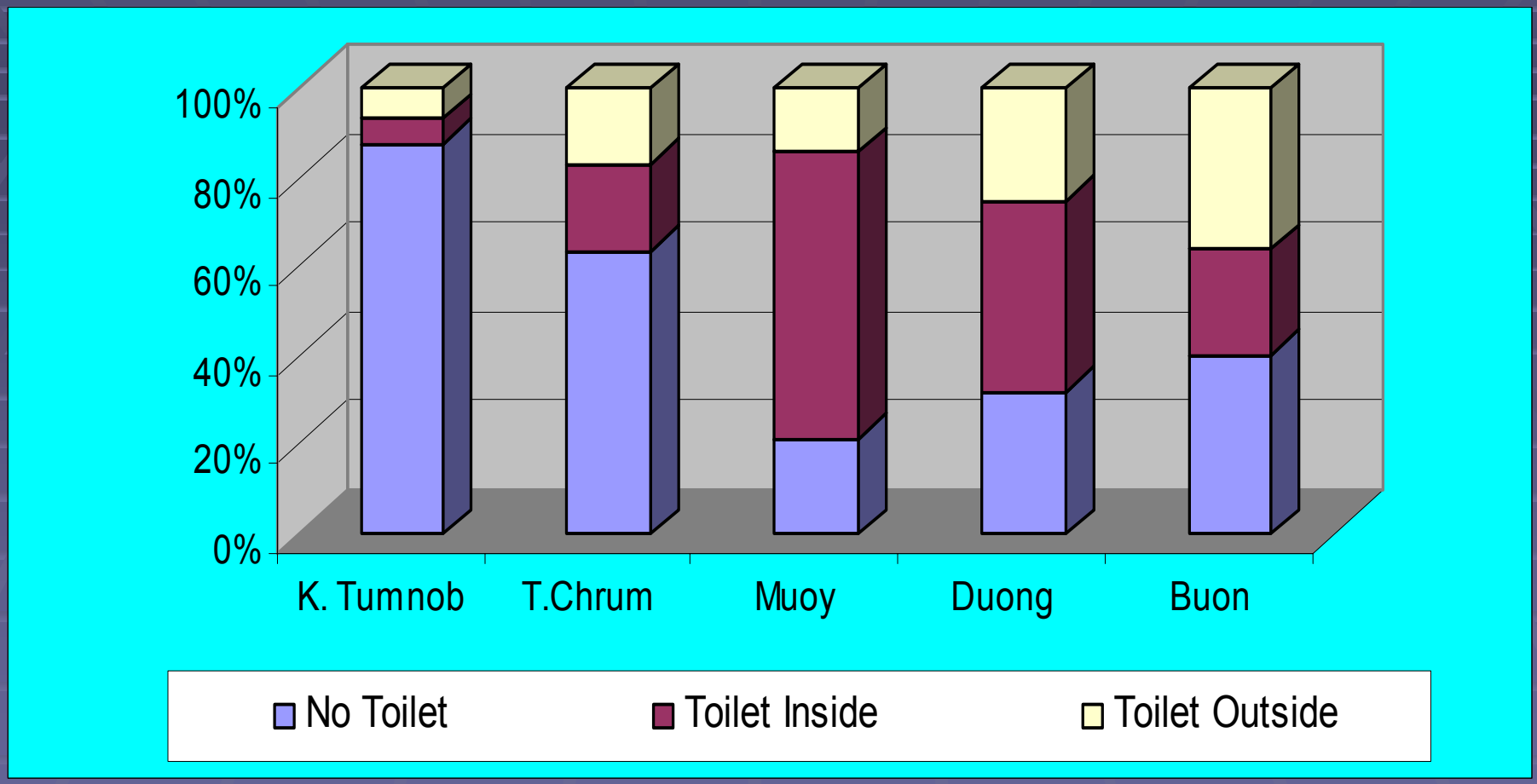




- Skin Problems and fevers and Diarrhea are more likely for morning glory producers who are in contact with waste water

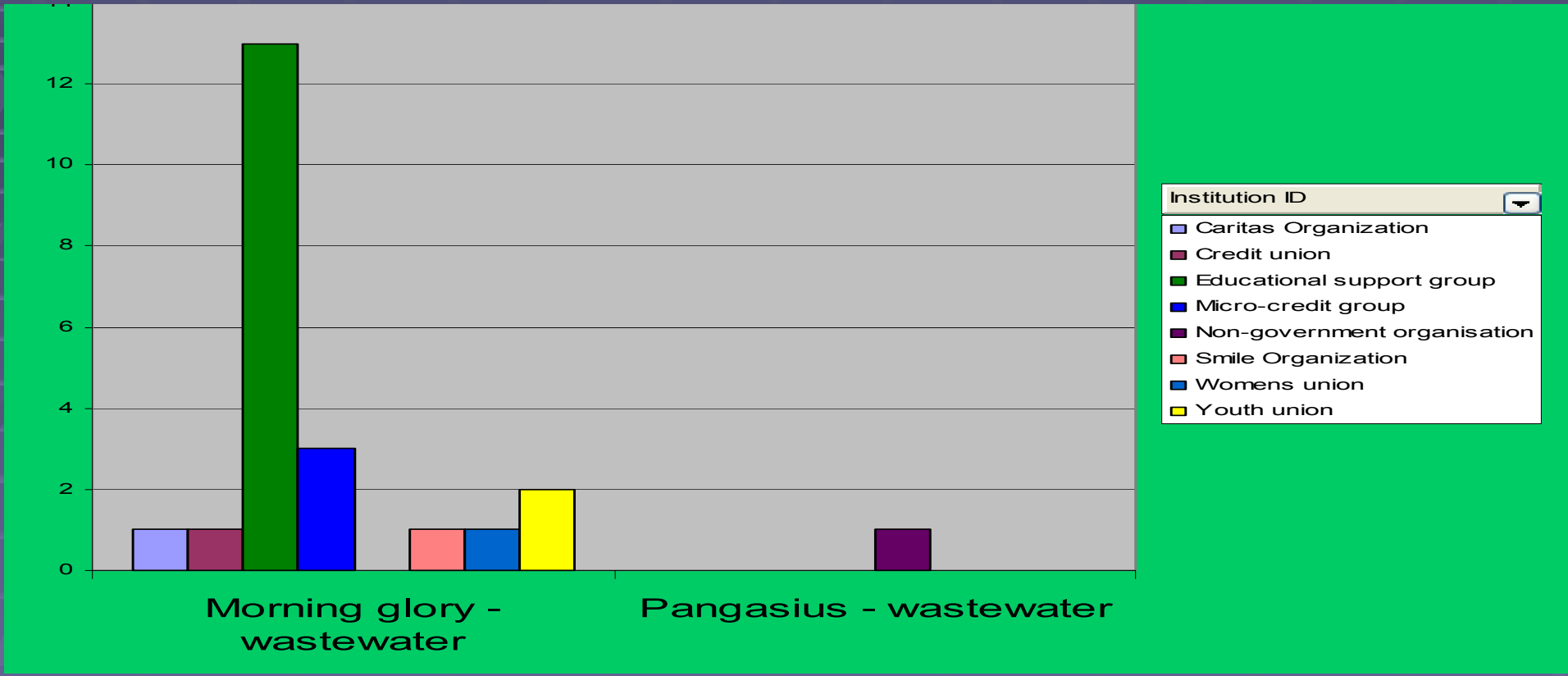
- Skin problem become worse during dry season (Monitoring 3)

Toilets by village



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

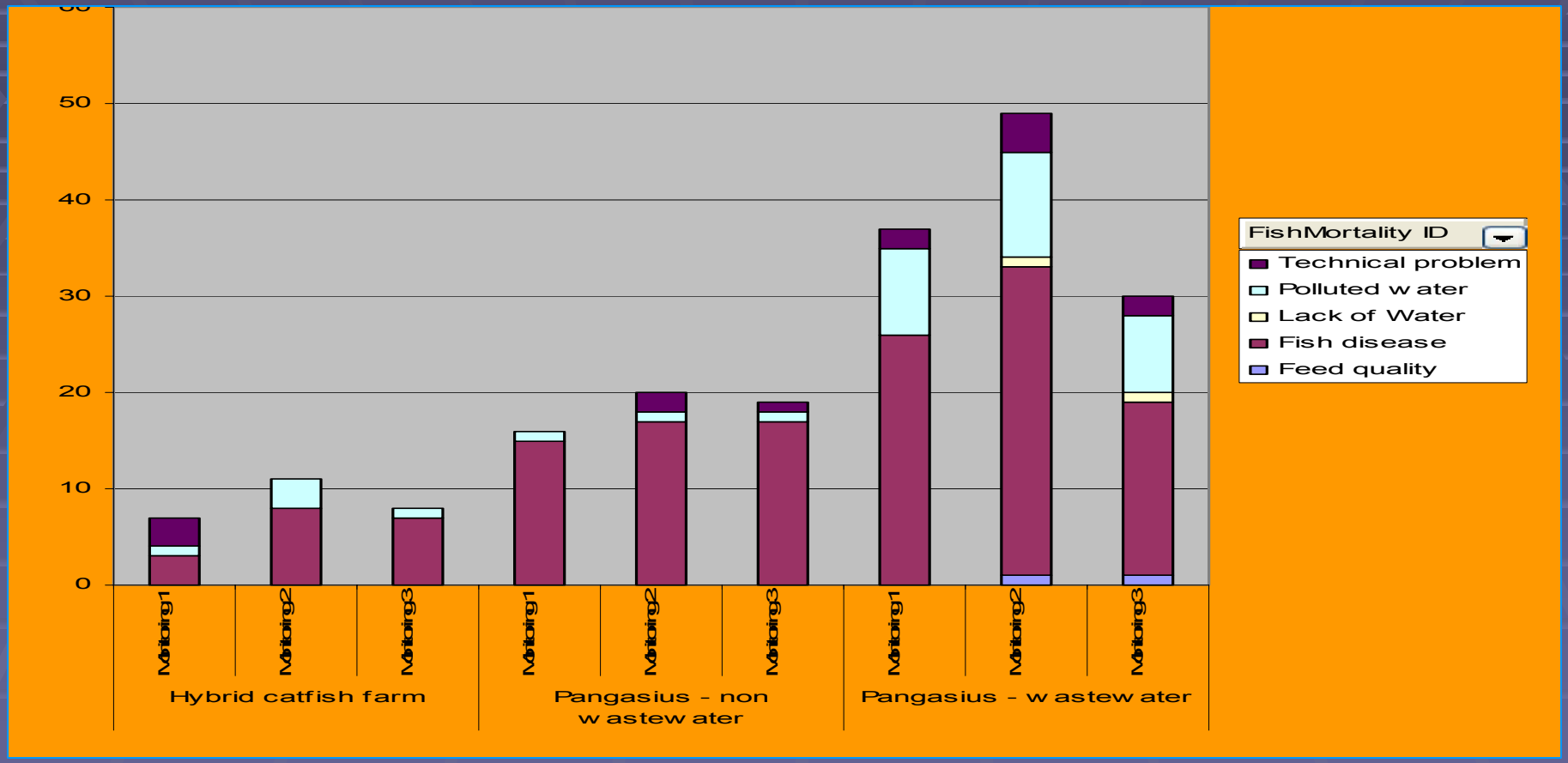
Institution in Aquatic production



- 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



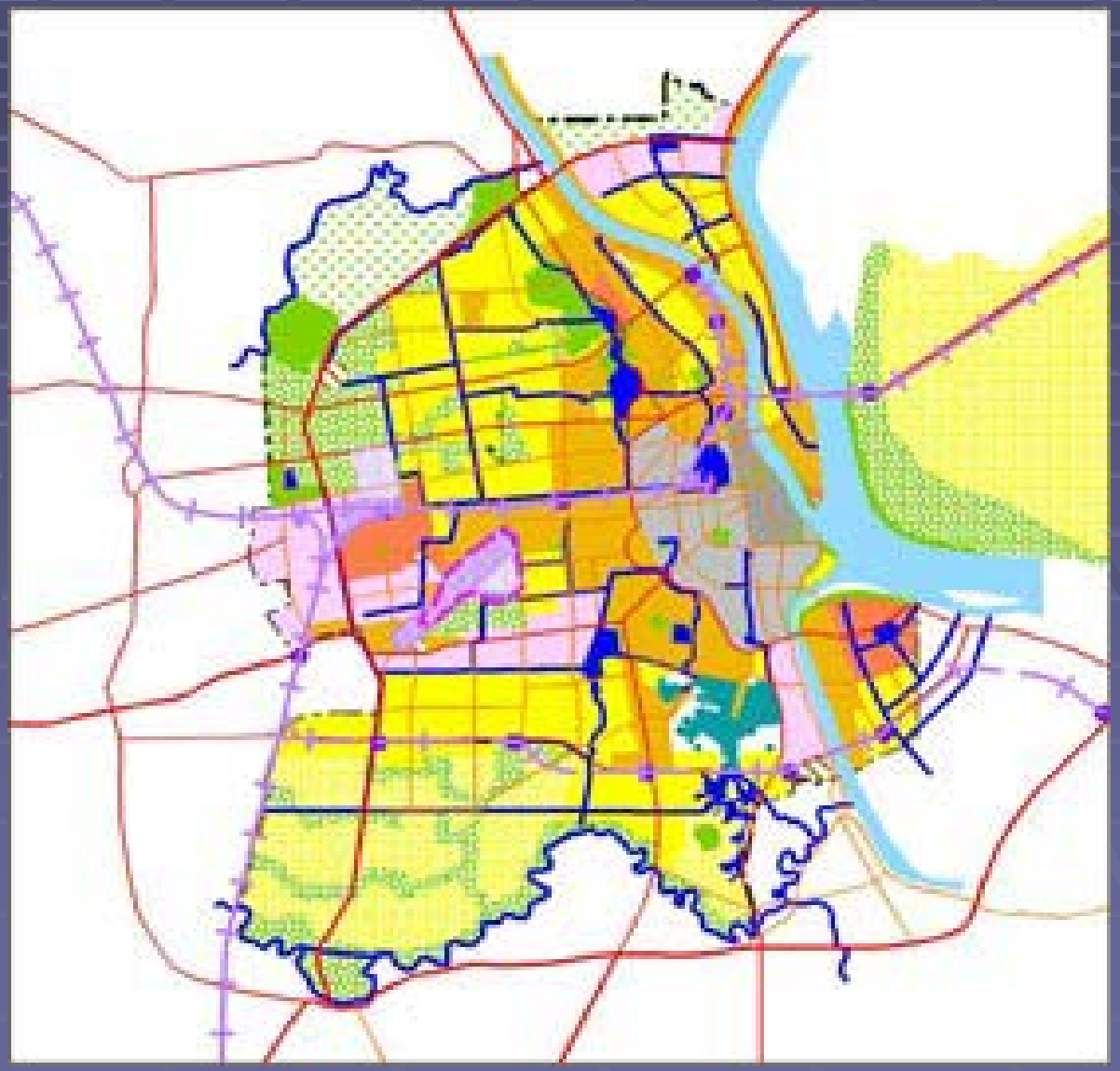
- Pangasius WW mortality is seasonal, more in December
- Major cause of mortality is disease and polluted water
- Technical problem is also in concern of mortality

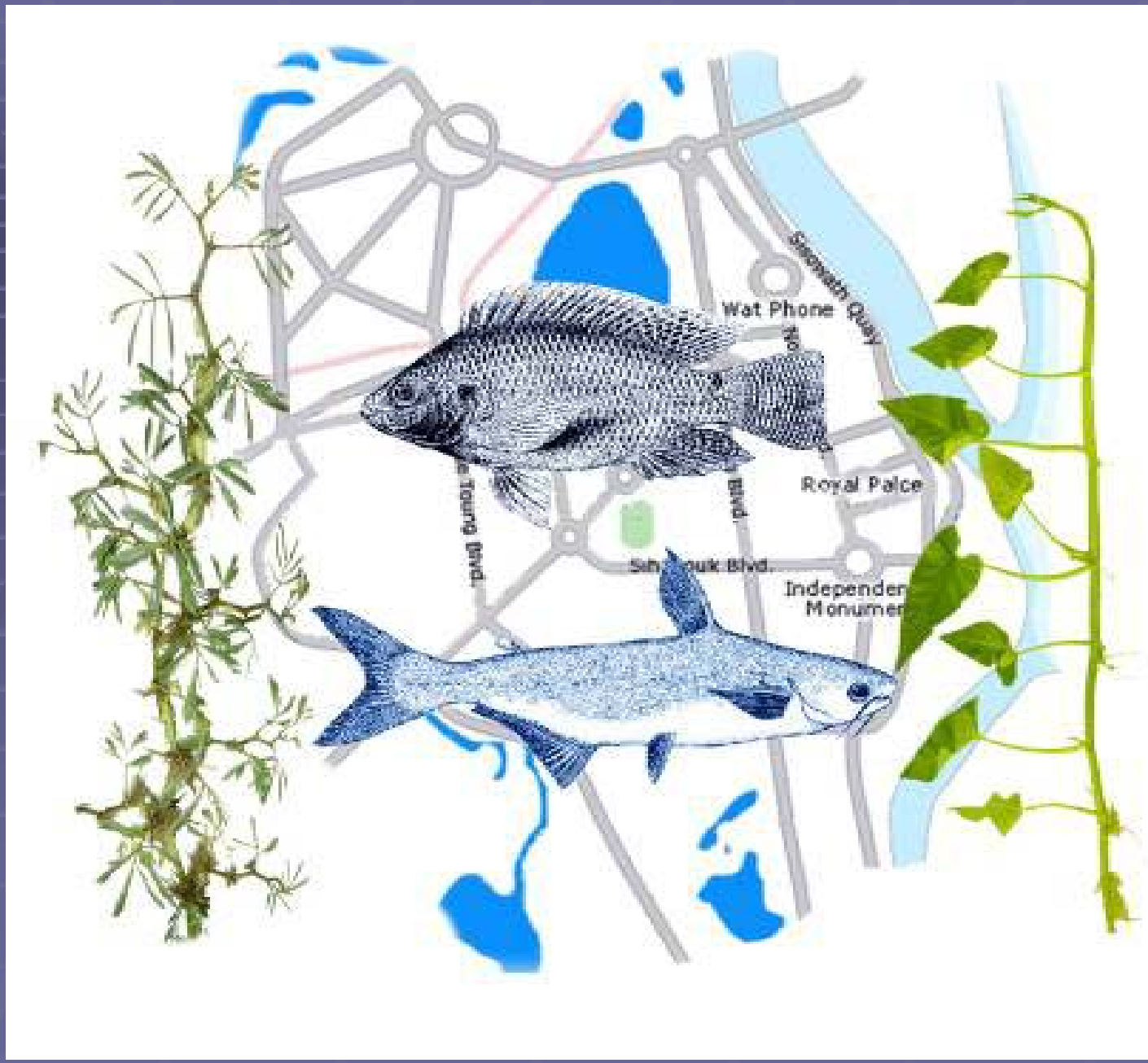
Institutional Issues

- 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

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Thank for your attention

This research project was funded by the European Commission