

User Conflicts in Tilapia
Aquaculture:
no matter where we go, we
always take it with us

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• Tilapia production systems:

- cages, ponds, tanks and in extensive culture based fisheries,
- large, medium or small scales'
- various levels of intensity





Traders, with aerated tanks, awaiting the arrival of tilapia



Signboard of a tilapia dealer

Benefits

- Important in rural poverty alleviation, integrated rural development, economic development and trade.
- Benefits include
- economic growth,
- stable and diversified livelihoods,
- increases in income and food security.

Impacts on the environment

water pollution,

loss of habitats and ecosystem functions,

disease outbreaks,

species introductions and reliance on
exotics,

biodiversity and genetic resources,

resource use conflicts.



Backyard tilapia pond and rice farm



Overcrowded cages

User conflicts are serious impediments to aquaculture development that led to conflicts nearly everywhere.

Uncontrolled development leads to

- conflicts over privatization of public commons and
- resource use,
- access to remaining resources
- environmental overload,
- resultant economic losses to the industry.

Resource conflicts in aquaculture can take two forms:

- **spill over effects or externalities** - impact of aquaculture on others
- **poor resource allocation systems** - inefficient distribution of resources among users.

Affected resource users include

- Capture fisheries,
- Agriculture
- Navigation/transport,
- Tourism
- Recreation
- Conservation
- Local communities' social and economic structures
- Existing or planned aquaculture operations



Sources of Conflict

- **Limited space** (in water, land) and **limited water** – conflicts with other users such as capture fisheries, agriculture, tourism, industrial water use
- **Waste** generation –nutrients, eutrophication, chemicals
- **Exotic species** - escapes, diseases and parasites, biodiversity and genetic losses
- **Economic impacts** –distort local fish markets, price inflation, competition with established economic activities.

Conflicts related to small scale, low intensity pond, tank production

Case Study – Batticola District, Sri Lanka (FAO)

- Dry zone, uses small tank cascade system with canals for irrigation.
- Low intensity culture in tanks, canals and seasonal paddy fields.
- Aquaculture low priority water use – below domestic, irrigation, livestock, fish



- Low intensity culture in tanks, canals and seasonal paddy fields.
- Growing number of households depend on tank production for livelihood, including women.



Fishpond in a rice field



Conflict with other agricultural activities when tanks used for aquaculture

- Privatization of a common property resource
- Reduced access to tanks for cattle watering because of bank erosion
- Conflict over stored water

Fish farmers drained tank for harvest when rice farmers needed irrigation water

Farmers use water without consulting fish farmers, damaging crop



- Conflict with upstream, pastoralists and forestry industries – incoming water quality affected
- Conflict with rice farmers who use pesticide in rice fields and that enters canals

Within farm conflicts

- Resource allocation among agriculture and fish farming
- Division of labor
- Conflict with traditional women's HH duties



Retailing small tilapia in a market

Successful Conflict Resolution

- **Local government** resolves common property issues, polices resource access and manages conflicts
- Growing **importance of fish** in local diet and economy
- **Collective management** of tanks and water resources
- **Integration** of fish farmers group into agricultural group
- **Shared labor** among fish farmers



Villagers harvesting a communal fishpond

Conflicts related to medium size, intensive cage production

Taal Lake, Philippines (ADB)

Conflicts with capture fisheries

- Preemption of water space,
- Lower water quality alters fisheries habitat and productivity
- Impacts navigation
- Competition in market between wild and cultured fish, lowers prices
- Fish attracted to structures, feed, and draw fishers who may poach

Conflicts with other producers



- **Overcrowding**
 - impacts water quality, causing declines in feed conversions and economic losses
 - increases competition for inputs, increasing operating costs
- **Intensification and growth** crowds out smaller, less efficient producers
- **Disparity in incomes** can cause friction

Other Conflicts

Household conflicts

- Allocation of resources, degree of risk, acquisition of capital assets involving credit in a high risk situation

Conflicts with tourism development

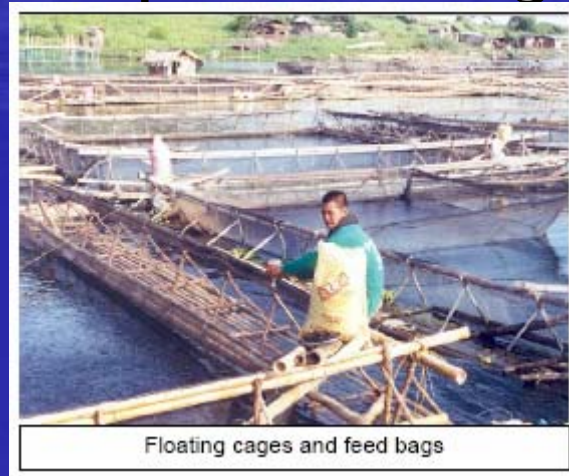
Damage to local economy

- Intensification and expansion increase demand for credit - compete for limited funds with other businesses, raise cost of borrowing
- Competition for inputs raises local prices

Illegal introductions of exotic species threaten both capture fisheries and cage producers with disease and parasites.

Conflict Resolution

- **Master plan** balance competing interests
- **Zoning, licensing** and designation of allowable activities
- **Local government** led in implementing policy and regulations



Floating cages and feed bags

Within Industry Conflict Resolution Failure

- **Failure to manage growth** – no limited entry, No effort to manage industry with other uses
- **No enforcement** – permits ignored
 - Increased stocking density
 - Illegal cages
 - Located outside designated zones
- **Illegal introductions** of exotic species contrary to existing regulations
- **Industry threatens itself** through overcrowding, declining water quality, low DO and fish kills, poor feed conversion and low production worsen harvests and erode profits

Conflicts associated with large operation (intensive ponds, Guyana)

- Conflicts of medium sized pond and cage operations magnified.



Conflict with local communities (small, rural) include:

- **Surplus fish dumped** on local markets.
- **Community excluded** from resource allocation and permits
- **Social disruption**
 - External labor,
 - Disease
 - Influx of cash increases prices
 - Decreased employment, lower labor demand over time
- **Loss of traditional amenity use**, access, travel corridors
- **Displacement** of smaller producers and fishers
- **Conflict with conservation and tourism**
- **Conflict with agriculture, power generation** for resources and financial and political power

Case studies: combination of extrinsic and resource allocation conflicts

Inefficient allocation of resources are due to weak institutions

- Lack of planning and policies
- Top down decision making
- Lack of coordination and coherence among sectors, institutions
- Unclear mandates – who is responsible for what
- Unclear public/private sector responsibilities
- Tenure, access, property and user right uncertainties

- Weak regulatory regimes and enforcement capacity
- Little involvement of primary stakeholders in allocation of land water resources
- Legal definitions and development regulations that skew access to natural resources
- Corruption, influence allow appropriation of resources by elites
regulations favoring status quo of inequitable distribution of benefits

Solutions: Regulatory and Policy Frameworks

- Current interventions are **reactive and uncoordinated**, less effective
- Appropriate **policies, legal instruments, and enforcement** remove underlying constraints to development, root sources of conflict.
- **Licenses, rules, regulations** provide processes for conflict prevention and resolution.

Regulations

- **Regulating aquaculture** provides orderly and sustainable development
- **Regulations reduce negative externalities** – such as pollution and conflicts over land, water rights, and restrictions on exotic species introduction.
- Regulations force the industry to **internalize negative externalities**
- **Regulations aim for positive externalities** such as licensing to preclude crowding, increase access to more entrepreneurs, foster development in selected regions
- Regulations predominate in curbing environmental effects

Zoning, permits and planning

- Conflicts best addressed through zoning, permits and planned development
- **Permits**
 - Regulate industry through clear allocation of use rights
 - Avoid user conflicts where potential for conflicts exists
 - Provide clear procedures for permitting to avoid conflicts.
 - Allows for evaluation by stakeholders
- Allocation of space through zoning and licensing.
 - **Zoning** is planning to mitigate environmental impacts and allocate resources.
 - **Licenses** designate allowable activities – maximum capacity, etc

Community participation in planning and use of land and water resources

- Planning designates areas for development that balances competing uses.
- Without strategic plan, short term financial perspectives dominate environmental and social issues.
- Current models:
- Top down – Asia model - central government agencies decide issues and needs of industry and control the process
- Bottom up, consultations with stakeholders identify constraints and needs. Plans more likely to succeed because it comes from and owned by end users. More costly in time money, effort

Planning for open and equitable development

- **Stakeholders empowered** and linked to policy decisions.
- **Public participation** in project permit approval and resource allocation processes
- **Integration of stakeholder concerns** removes potential for resource use conflicts

Effective conflict free aquaculture development

requires

- Sound governance,
- Effective institutions
- Stakeholder participation,
- Multisectoral scope, and
- Ccoherent policy and planning.

