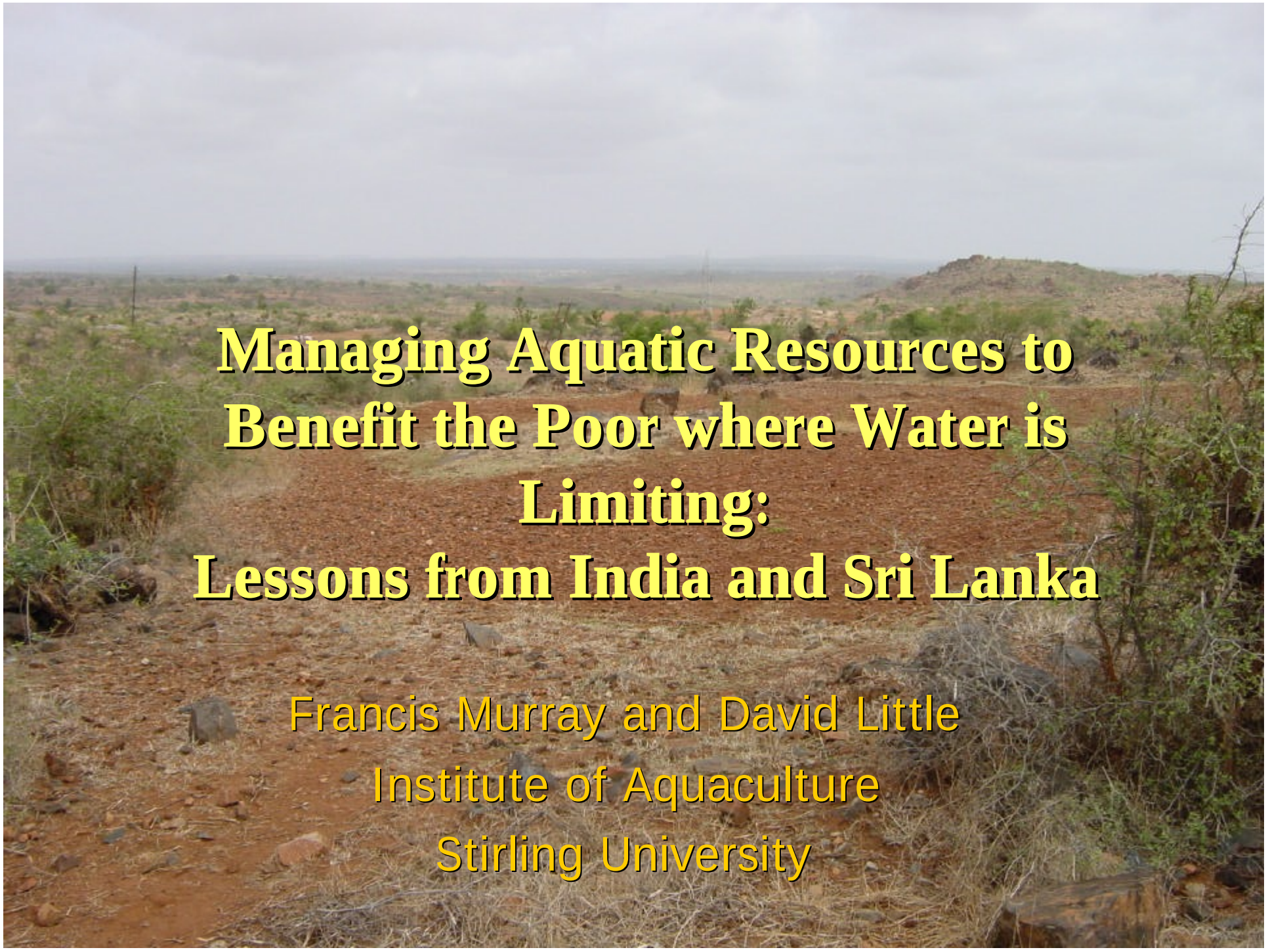

Managing Aquatic Resources to Benefit the Poor where Water is Limiting: Lessons from India and Sri Lanka

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Background

- DFID & CARE funded, collaborative project
  - India – Raichur District - Karnataka State
  - Sri Lanka – NW Province – Dry Zone
- Framework
  - Water scarcity – Increasing productivity
  - Poverty focussed
  - Systems approach
- Farmer / community managed irrigation systems
- Methodology
  - PRA followed by farmer-managed trials 98-2002

Partnership & Collaboration

- India: NGO Samuha
  - Pre-existing framework for research
- Sri Lanka: CARE International & Peradeniya University
  - Logistical support
- Benefits
  - In built dissemination pathways
- Constraints
  - Lack of existing research/ aquaculture capacity

India - Watershed Approach

- Current model for dryland development
- Hydro-geological v admin boundaries
- NGO emphasis - Peoples Institutions
  - Women's and landless groups
- State emphasis - Physical Infrastructure
  - Soil and water conservation (SWC)
- Sustainability v Scaling up problems

Sri Lanka – Household

- Household or village level
  - Traditional water harvesting structures
  - Conventional development has ignored intra & inter-community factors
    - Multiple use priorities & conflicts
    - Hydrological and other related upstream and downstream resource flows

Livelihood Characteristics

Sri Lanka	India
RF: 1200mm	700mm (Semi-Arid)
70% Rainfed	80%
< 40% lower castes	> 68% STC
25-30% child malnutrition	> 45-50%
Off-farm labour	Labour migration

Demand for Inland Fish

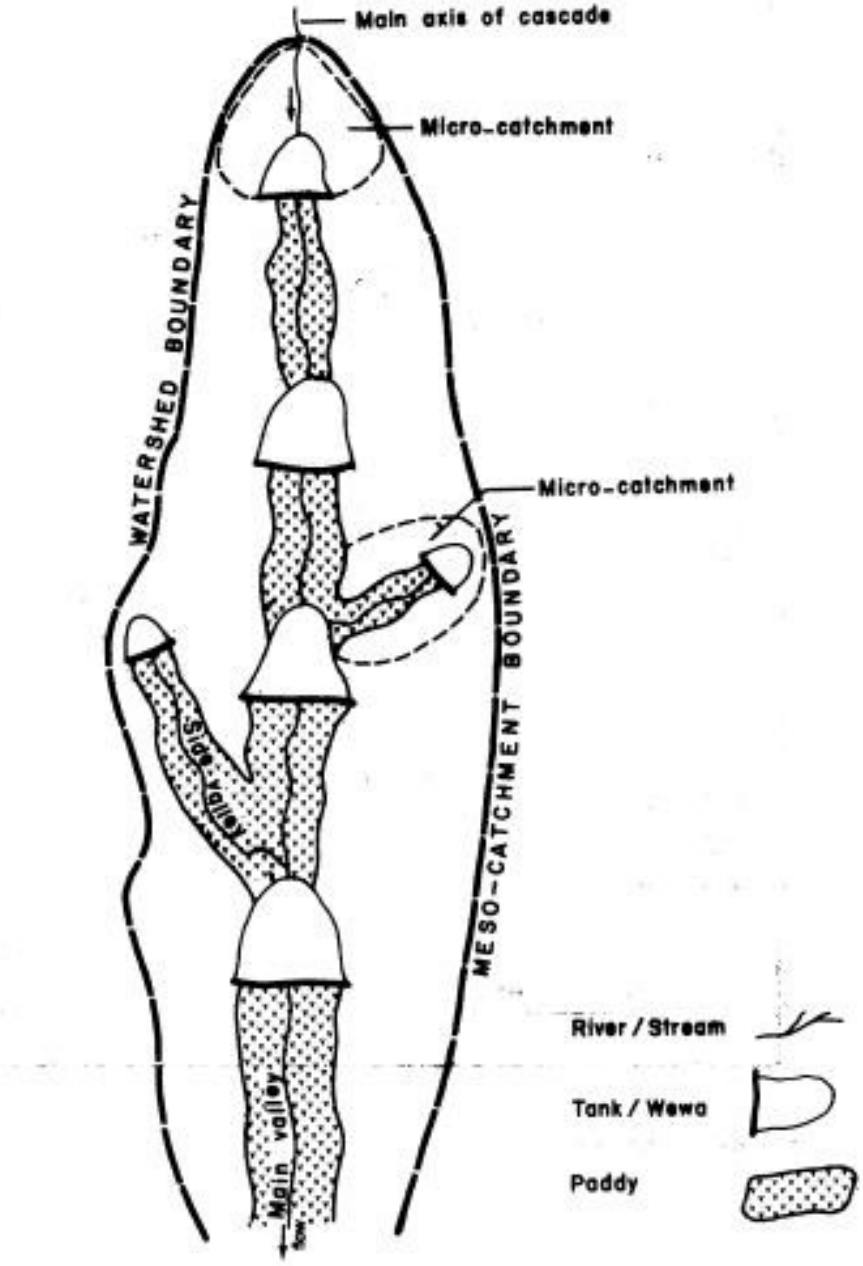
Marketing

Sri Lanka	India
70-90% Tilapias	IMCs, River fish
Small fish 60-70% retail value of large fish	
Rural consumption	>1kg fish - urban markets
Supply matches demand	Poor rural match
Small-scale networks	Oligopolies
Producer margins - 50% 10-15kg consumption	Poor Margins - 25% <3kg
High impact on vulnerability	Low impact

Small-scale production – Sri Lanka

- Negligible commercial contribution
  - Erratic seasonal production
  - Consumer perceptions: Off-flavours / colour
- Household consumption
  - Collective harvesting: community activity
  - Staggered hook and line fishing
  - Visibility: persistent cultural taboo
  - Most important to poorer households


The Water Resource



Sri Lanka:
Small-tank cascade systems

- Community managed
- 'Micro' watersheds ('00s of Ha)
- Upper tanks smaller <10ha)
- Seasonality & Spill
- Marginal groups

Small-scale water bodies - India

- **Types of water bodies and seasonality constraints**

1. **Ravine reclamation Structure - < 1mnth**
2. **Nala Bund: 0.5 – 2 months**
3. **Farm Ponds: 1-3 months, low potential**
4. **Percolation tanks: 1-6 months**
5. **Farm Irrigation Tanks: Perennial**
6. **Check Dam: 6 -12 months**
7. **Open wells: Perennial**

Open Well - Unlined


Check Dam – Mid Watershed


Check Dam - Upper Watershed (June)

Access

- Open wells: private – better-off
- Check Dams in India & Seasonal tanks in SL are common pool resources
  - Local rules and norms
  - Opportunities for landless (& women's) groups
  - Appropriation by elites
  - Multiple use & conflicts

Tank Multiple Use Priorities

- Irrigation ***
- Bathing domestic ***
- Livestock **
  - watering & grazing
- Aquatic production *
  - Fish, plants, game
- Micro-industries *
  - Brick-making
  - Sand & gravel
  - Cajun retting

Less well perceived:

- Flood control
- Silt harvesting
- Ground water recharge
- Environmental
- Ritual / symbolic

- (Rarely consumption)

Multiple use conflicts

- Externalities – User doesn't pay
  - Consumptive uses
  - Water quality modifying uses
- Irrigation, bathing and fishing
- Severity of problems depends on
  - Time of year
  - Climatic variation
  - Size of waterbody

CPRs – Who benefits?

- Inter-community:
  - Kinship / Caste & Wealth
- Intra-community
  - Wealth, Gender, Age
  - Needs based / Customary Norms
- Conventional stocking initiatives are poorly targeted – frequent conflicts

Accessibility & Poaching

- Sri Lanka – Tank and village proximity
- In India most water bodies are located away from villages increasing the likelihood of poaching

India - Farmer Managed Trials

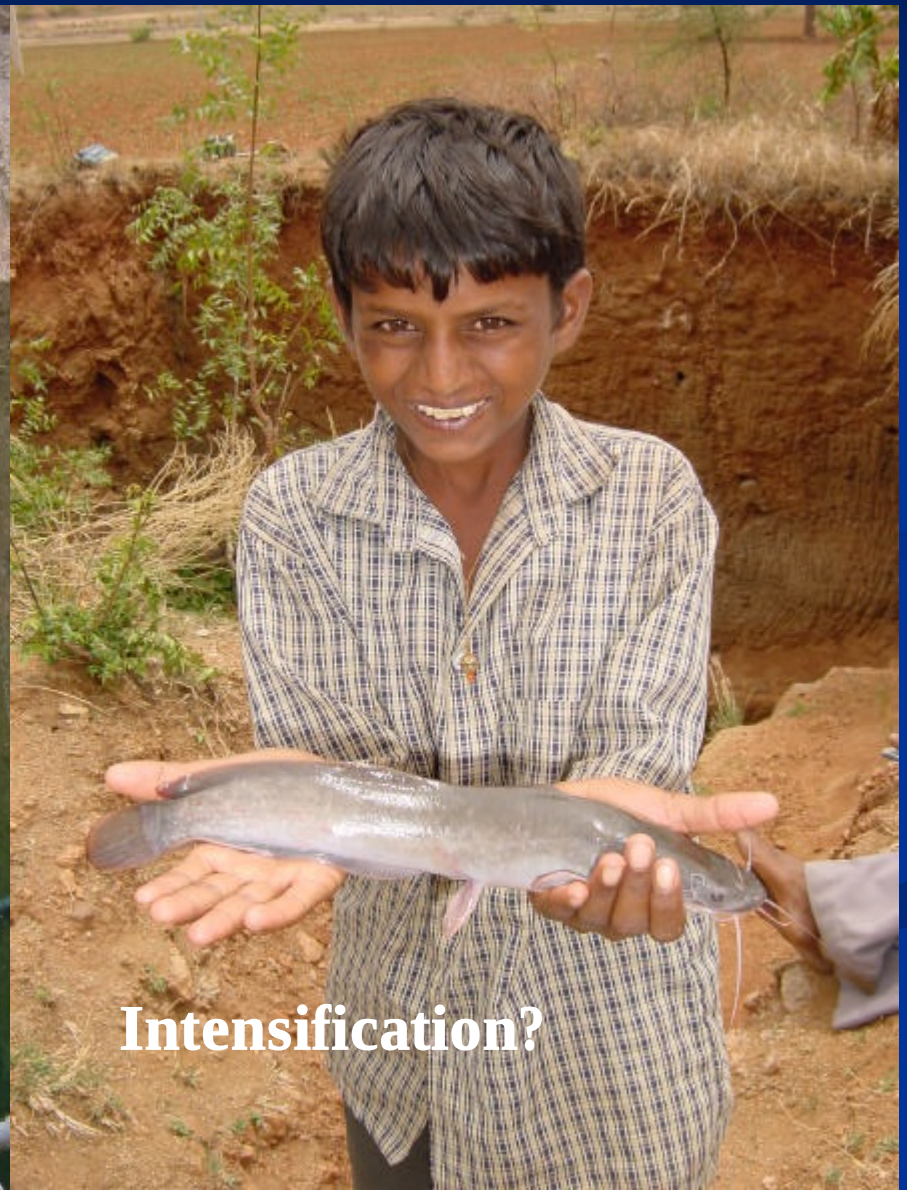
Fish Variety	Water Body	Outcome
Indian & Chinese Carps, Tilapia, Local Species	- Farm Ponds - Open Wells - Check Dams	- Seasonality - Predation / multi-use - Poaching / escape
Catfish (C. gariepenis)	- Backyard ponds (Women's Groups)	- Poor growth
Catfish (& local Species)	- Open wells	- Rapid growth / short cycle

Fish Seed - India

Hatchery seed available but poor access in arid areas

Catfish in Backyard Ponds

Catfish in Open Wells



Intensification?

India - Outcomes

Benefits – farmer opinion

- **Ready access for consumption or income**
- **Increased water use efficiency**

Major Constraints

- **Lack of feed resources & poor growth**
- **Low familiarity with production & consumption**
- **Availability of juvenile fish for stocking**

Sri Lanka – Farmer managed trials

- Highly seasonal tanks - <2-3 Ha
  - Dry periodically with complete loss of stocks
- Stocked tilapia fry / adults & snakehead fry sourced from lower perennial tanks
- Early stocking: contrary to farmer perceptions low risk of spill events & fish loss
- Negotiation and adaptation of access rules

Sri Lanka Outcomes

- Yields improved through staggered harvesting & early stocking
  - Targeted poorer households
  - Hook and line fishing reduces multiple use conflicts
  - 9 of 24 households harvested 0.5-1.5kg fish 2-3x/wk, 2-3 months.
- Collective action & cohesion
  - Lowest Caste groups most cohesive
  - Higher Caste groups increased conflicts
- Adaptive learning process