

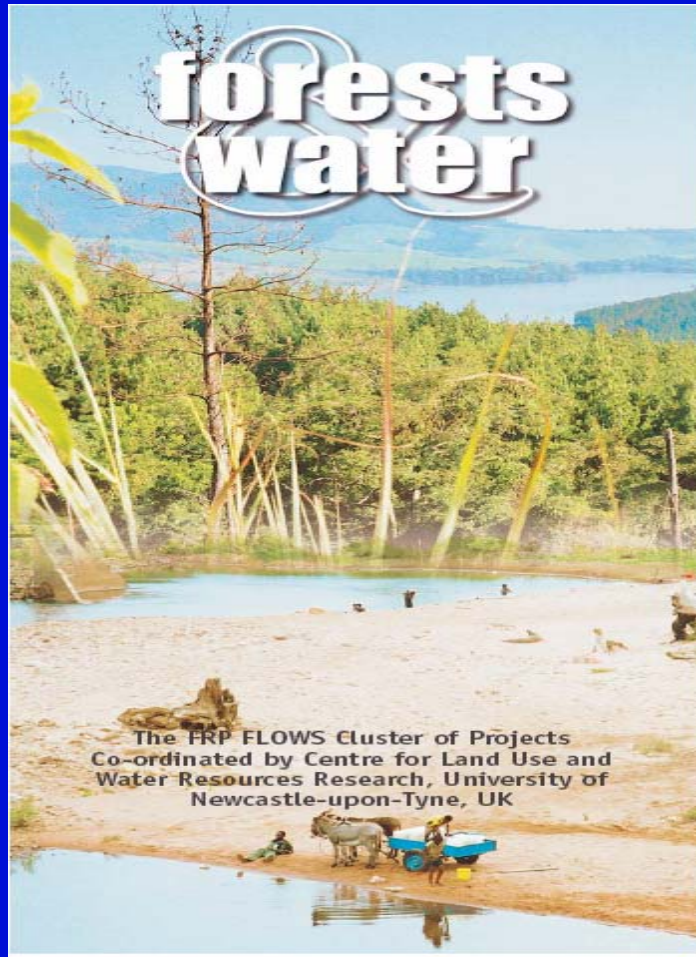
DFID FRP Research Cluster on Forests and Water

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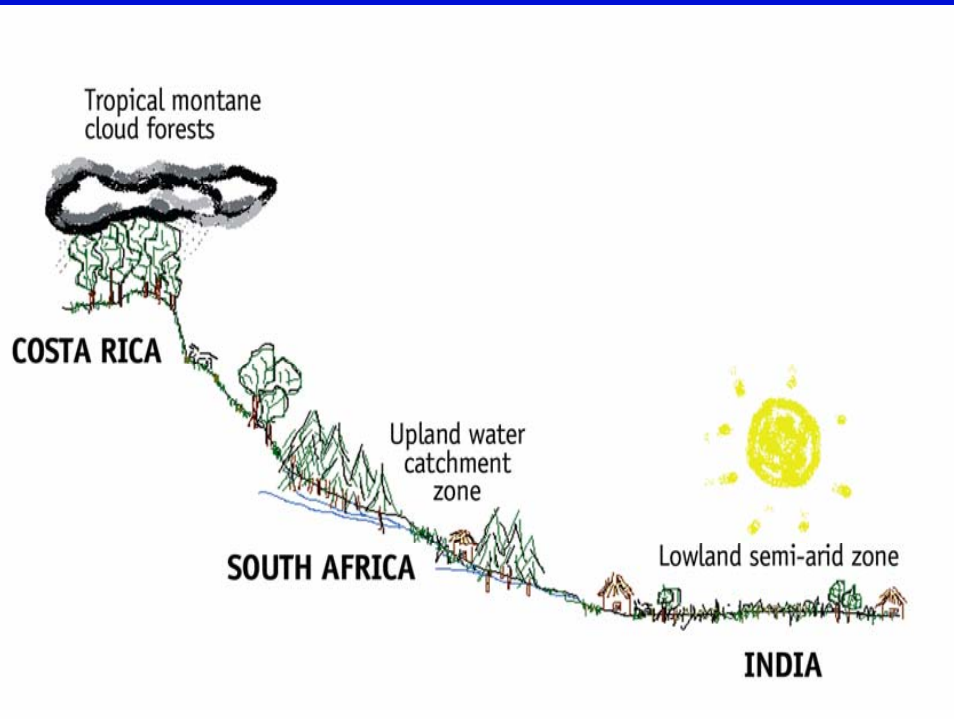


DFID Funded research on Forests and Water



- ◆ Recognises differences in the Public and Science perceptions about the role of forests and water
- ◆ FRP research (~M£2) worldwide aims to better understand forest and water impacts:
 - Biophysical
 - Socio-economic
 - Bringing together “science” and “public” perceptions –Connecting science with policy
 - Improve livelihoods

DFID Funded research on Forests and Water



- ◆ Research is being carried out along a notional altitudinal transect from high altitude cloud forest in Costa Rica through the intermediate water catchment zone in South Africa to the lowland semi-arid zone forests in India.
- ◆ Biophysical focus: Impact of forests on dry season flows

Forests and Water

Public perceptions

Forests are good for the water regime:

- Forests increase runoff**
- Forests regulate flows**
- Forests reduce erosion**
- Forests increase rainfall**
- Forests reduce floods**
- Forests “sterilize” water supplies - improve water quality**



Are the Public perceptions true?

- Important to know for management of land and water resources.
- Many forestry projects are supported for perceived hydrological / environmental benefits.
- Much Forest-Water policy based on these beliefs

– From Bass and Hearne 1999
A review of instruments for ensuring sustainability.

Table 1: Current beneficiaries of goods and services from the forests

<i>Goods and services from forest</i>	<i>Local benefits</i>	<i>National benefits</i>	<i>Global benefits</i>
1. Wood products	X		
2. Non-wood products	X		
3. Maintenance of hydrological cycle	X	X	X
4. Soil and water quality conservation	X	X	
5. Wind and noise control	X		
6. Landscape amenity	X	X	X
7. Recreation and tourism	X	X	
8. Cultural and religious services	X	X	X
9. Microclimate regulation	X		
10. Climate moderation		X	X
11. Maintenance of biological diversity	X	X	X
11. Scientific research and education	X	X	X

Based on: Segura, O. et al. 1996.

Forest / Water Policy & beliefs

FRP FLOWS issues

South East Asia:

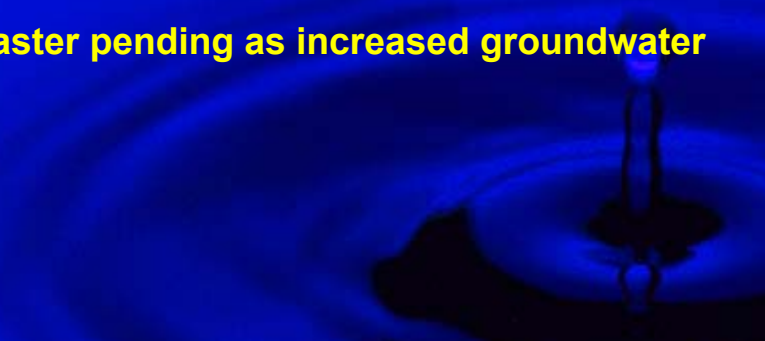
Belief in close connection between deforestation and large flood events has led to logging ban:

- **Livelihood impact: ~1,000,000 people out of work**
- **Economic impact \$1,900,000,000 lost revenues per year**

India:

Belief that forests increase groundwater recharge, and focus on forestry programmes as a means of improving groundwater resources, obfuscates real issue of:

- **Demand management of water resources for irrigation**
- **Imposing realistic charges for electricity – 2/3 of all power generated in some southern Indian states is for pumping groundwater**
 - **Livelihood impact: water tables > 250m, hand pumps not working, poor people have to buy water from tankers**
 - **Economic impact: economic and social disaster pending as increased groundwater pumping is not sustainable**



Forest / Water Policy & beliefs

FRP FLOWS issues

RSA, Africa:

Recognition that plantations and alien invaders are high consumers of water has led to new types of non- market based forest/water policy instruments: WFW,SFRA

- Livelihood impacts: not known
- Economic impacts: not known
- Water resource: not well known

Rest of World:

Market-based policy instruments being developed, markets for watershed services:

- Based on the forest/water myths rather than science?
 - Payments often small
 - Unsustainable unless real service can be demonstrated.
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- Livelihood impacts: no evidence that poor people are benefited (Landell-Mills and Porras , 2002)
 - Economic impacts: ?

Are the Public perceptions true?

Hydrological research indicates:

- more complex and
- generally less advantageous

relationship between forests and water:

- **Forests increase runoff** - no
- **Forests regulate flows** - Site specific *****Key issue for FRP FLOWS
- **Forests reduce erosion** - Not always
- **Forests increase rainfall** - Not proven (small effect)
- **Forests reduce floods** ~10 -50% effect on MAF, probably no effect on big floods
- **Forests “sterilize” water supplies - improve water quality** - Not in high pollution climates

FRP FLOWS research aims to improve understanding and dissemination of the bio-physical interactions

FRP FLOWS Research

- ◆ **Catchment Management and Poverty, CAMP**

- ◆ **Forestry Impacts on dry season flows**

Notional altitudinal gradient from

- **Costa Rica**

- Bio-physical: Cloud forest impacts on water resources, low flows,
 - Socio-economic: Markets, Livelihoods, socio-economic

- **India**

- Bio-physical: Dry zone impacts on water resources, low flows,
 - Socio-economic: Perceptions, Dissemination



Catchment management and Poverty (CAMP) – South Africa, Grenada and Tanzania

◆ In water-stressed environments livelihoods affected by access to water

- land and water management policies not generally evaluated against this impact

◆ RSA Concern about impact of forestry operations, alien invaders on water resources



CAMP is comparing and contrasting approaches to development:

- resource focussed (integrated water resources management, IWRM)
- people focussed, Sustainable Livelihoods (SL)



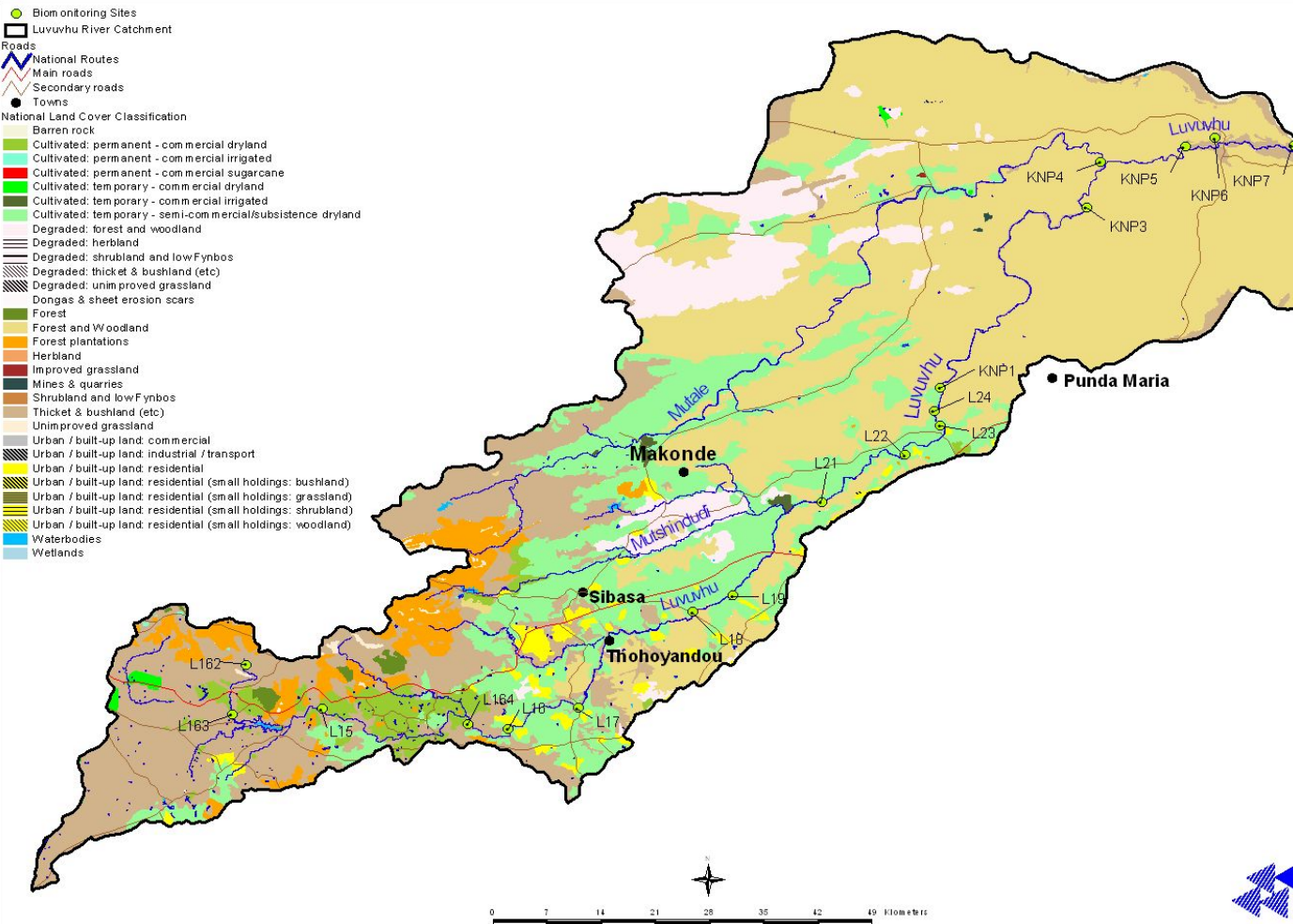
Catchment Management and Poverty alleviation (CAMP)

RSA government:

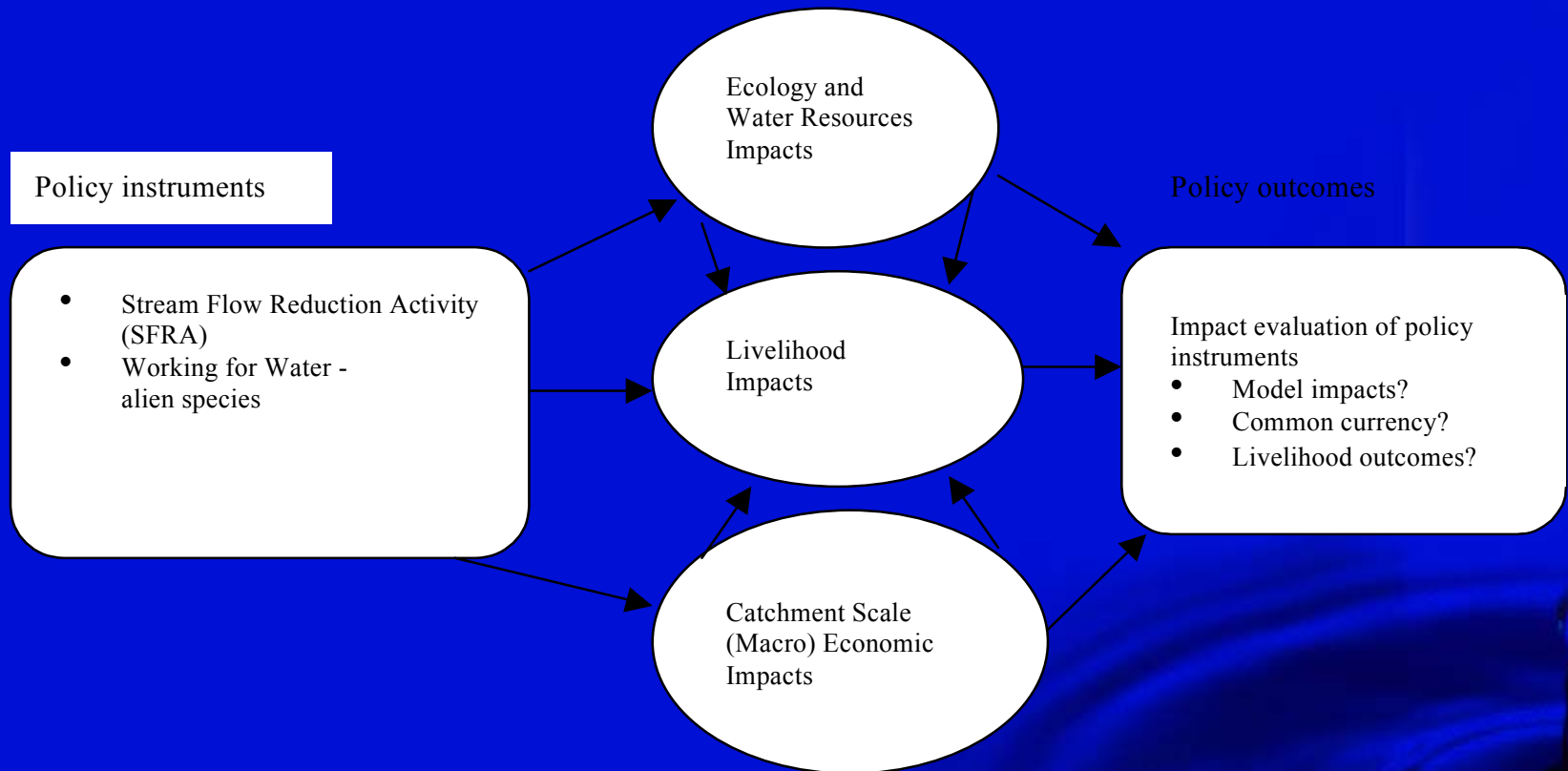
- ◆ Recognises downstream water resource impacts of fast growing commercial plantations and “escaping” plantation trees.
- ◆ Funds Working for Water Programme for eradicating alien invaders -water resource, ecological, poverty alleviation benefits.
- ◆ How to devise policy instruments which satisfy IWRM (water resource, basin economics and conservation) and Livelihoods?



Luvuvhu catchment land use Limpopo Province



The CAMP project is investigating how two forest and water related policy instruments, the Working for Water Programme and the charging of landowners for Stream Flow Reduction Activities (SFRAs), will affect water resources, catchment scale economics and livelihoods



Cloud forests – Costa Rica

Bio-physical and socio-economic impact of cloud forests

Bio-physical research

- ◆ What is the relationship between the area and distribution of forest and pasture, at different altitudes, with river flow, particularly dry season flow?



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Bio-physical research

- ◆ Free University of Amsterdam:
 - develop mathematical models, calibrated from measurements of cloud water deposition rates
 - to determine and predict the impacts of forest, at these high altitudes, on the water regime.
- ◆ Models to be tested against historical hydrological and land use records in the Tilarán area.



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Cloud forests – Costa Rica

Socio-economic research



C.R. Environmental law allows upland land owners to negotiate compensation deals with downstream users of water

- ◆ **Existing mechanisms based on conventional wisdom:**
 - forests, whether at high or low altitudes, will lead always to improved water resources and improved dry season flows
- ◆ **Survey will identify how stakeholders value the forest and its environmental benefits**
- ◆ **Aim to suggest appropriate “science based” compensation mechanisms**
- ◆ **FRP FLOWS projects aim to deliver a decision-support system to assist the development of market based policy instruments.**

Impact of forests on water resources in the semi-arid zone, India

Research will focus on:

- ◆ Modelling and field calibration of the influence of forests on the flow regime (particularly dry season flows) in dry zone conditions.
- ◆ Communicating the “science perception” to stakeholder organisations and local communities. Research is under way into how the institutional and public beliefs about forest and water arose and how they can be reconciled, together with the development of web-based GIS dissemination tools to assist this process.



Impact of forests on water resources in the semi-arid zone, India

“Perceptions” component important because:

- ◆ Suspicion that large spending of development funds in India is based on erroneous belief that tree planting will increase groundwater recharge.
- ◆ Equally – if not more serious– concern that focus on forestry programmes for improving water resources diverts attention from urgent need for demand-management of groundwater abstraction.
- ◆ Groundwater table often >250 m , hand-pumps not working, villagers buy water from tankers, pumping groundwater accounts for up to 2/3 of all the electricity generated in some states.



Partners and Funding

- ◆ The Forestry Research Programme is one of ten competitive grants programmes of the Department for International Development's Renewable Natural Resources Research Strategy (RNRRS).
- ◆ FRP helps country partners in the eradication of poverty by supporting research on priority developmental problems of the forest-dependent poor.
- ◆ Output from FRP FLOWS projects will count towards DFID's contribution to the UN International Year of the Mountains 2002.

FRP FLOWS and the Shiga Declaration on Forests and Water Nov. 2002

Shiga Recommendations:

1. Move from a sectoral to an integrated and cross-sectoral approach to economic, social and environmental planning at local, national and international levels. This approach would build on and develop the necessary bio-physical and socio-economic understanding of forest and water interactions to identify key forest and water issues in the context of the location concerned.
 - *Close connection with FRP FLOWS objectives RSA, Tanzania, Grenada, Costa Rica, India*
2. Establish the total economic value (capturing all products and services) of forest and water resources, and the economic implications of different policies and management practices. The distribution and the importance of benefits to particular stakeholders should also be established.
 - *Close connection with CAMP, IIED markets research*

Shiga Declaration on Forests And Water

Recommendations

3. Put in place appropriate incentives to support the sustainable management of forest and water services to ensure that those who use resources pay the full cost of their exploitation and those who bear the costs of conservation are equitably compensated. In particular, consideration should be given to the provision of secure resource rights, the reform of water pricing policies, the development of market-based or other mechanisms of payments for environmental services, and the removal of undesirable (perverse) subsidies to the agricultural and forestry sectors.
 - *Markets research, Link with CGIAR Challenge?*

Shiga Declaration on Forests And Water

Recommendations

4. Promote effective and equitable collaborative arrangements and partnerships among governments, local communities, research institutions, civil society, the private sector, forest and water managers, and other stakeholders. These will facilitate knowledge sharing and capacity building, leading to sound science-based policy development and tangible improvements in forest and water management.
 - *If WSSD cannot get full International agreements need other mechanisms and partnerships, also between donors (e.g. FAO, CGIAR, World Bank, DFID) Need to better connect science and policy – myth busting*
5. Address forest and water interactions in forest resources assessments, and request that the international community provides sufficient resources to accomplish this important task.

Sustainable markets for environmental services

Worldwide mechanisms are being promoted for

- ◆ **conserving environmental services**
 - ◆ **protecting indigenous forests,**
 - ◆ **providing compensation payments to inhabitants of upper water catchments**

 - ◆ **For mechanisms to be sustainable and defensible requires Reconciliation of the public and science perceptions of the role of forest**
 - ◆ **The bio-physical and socio-economic impacts of changing land use and forest cover are better understood**
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