Press Clippings

(1-15 September 2007)

Foundation for Ecological Security
Anand

This is a selection from a cross section of the print media compiled fortnightly for internal circulation. News, articles and other features are reproduced as they appeared.

Press Clippings

(1-15 September 2007)

Contents

SL.#	Category	Title	Newspaper	Pg #
1.	**Wildlife & Forests**	Last chance to save tigers: *India, China are key to survival of the species*	Times of India (A)	1
		State gets ready to fight relocation of lions: *MP mounting pressure on Centre to include translocation proposal in agenda of NBW meeting*	Indian Express	2
		Votebank politics encroach on forest land: *Forest department airs concern as Congress and BJP promise over 500 sq km of forest land to tribals*	Indian Express	3
2.	**Water**	Time to end subsidy on commercial use of water: PM	Indian Express	4
		On the water's edge: *Centre needs to abandon its wait on the sidelines policy on interstate water sharing. It must set up an institutional mechanism, both to resolve disputes and to increase efficiency of water use*	Indian Express	4
		Water Management in Europe: *Tapping the source right*	Business Line	6
3.	**Development Issues**	A job of looting: *How the rural employment scheme in Orissa is rendered meaningless*	Indian Express	7
		State panel to study energy conservation	Times of India (A)	8
		Deadline for local bodies to follow waste management rules: *Call for campaigns on source reduction, reuse and composting*	Hindu	9
	Agriculture	State fails to reach PM's aid to farmers	Times of India (M)	10
		Agriculture where India and China stand	Hindu	10
		The farmer wanted a motor bike	Indian Express	12
	Climate Change	So what have you done about climate change today? *Many old themes and a few good ideas at the climate changes talks in Vienna*	Indian Express	13

In ward Nr 479
Date 30/9/07

SL.#	Category	Title	Newspaper	Pg #
		APEC summit global warming, and coal use: *The fate of our warming planet hinges of six nations, and five of them meet in Sydney this week*	Hindu	14
		A 10 percent solution: *Ethanol can help India secure its energy future*	Times of India (A)	15
		India in the hot seat: *On global warming, India shouldn't just bargain hard at International for a. It should start acting unilaterally*	Indian Express	15
		Climate change could trigger global food crisis: *Experts issue warning at U.N. backed forum on sustainable development*	Hindu	16
		Climate turns into $20 trillion issue: *Vienna meeting aims at new global agreement to include US, China in environment pact*	Times of India (A)	17
		Dryland farmers and climate change: *A combined effort to deal with climate uncertainly, land degradation, and water scarcity is needed*	Hindu	18
4.	**Views**	There is increasing confidence in carbon markets	Times of India (A)	19
Articles of the fortnight		People's rule: *Karnataka has carried forward the tradition of local governance prevalent in the princely state of Mysore*	Frontline	20
		Water governance workshop: *Water a life support system- Issues related to water in Andhra Pradesh*	Wasteland News	22
		Five myths of the agrofuel transition: *Biofuel baggage*	Wasteland News	24
		Ecological security: The foundation of sustainable development	Wasteland News	31
		Tiger forever	Seminar	32
		Communities and conservation	Seminar	38
		Interview: *R.S.Negi is a leading environmentalist of Kinnaur*	Seminar	44
		Safety net programmes: *Outreach and effectiveness*	Economic and Political Weekly	47
		Institutionalizing common pool resources management: *Case studies of pastureland management*	Economic and Political Weekly	58

TIMES OF INDIA (A) 8.9.07 (A)

Last Chance To Save Tigers

India, China are key to survival of the species

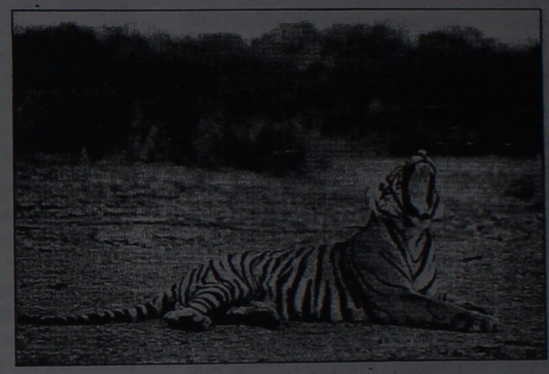
Vinod Thomas

The charisma of the tiger has inspired poets, persuaded nations to adopt it as their emblem, and sold everything from gasoline to sport merchandise and confectionery. Yet universal appeal has not assured the survival of the tiger in the wild.

There is still a chance to save the tiger from extinction, but that will require a concerted effort in the two largest developing economies, China and India — to control the trade in tiger parts, and to protect habitats.

Of the seven sub-species of the tiger (Panthera tigris), the Balinese, Javanese and Caspian tigers have already disappeared and the South China tiger is on the brink.

India is the last hope for the future of the species because it has the largest number of wild tigers and a conservation infrastructure with a system of connected protected areas. But tragically, India's tiger population too has collapsed. Experts say that according to the latest census as well as corroborating evidence, the Indian population of tigers has plummeted dangerously close to the tipping point for the loss of the species.



By its position in the natural order, protection of the tiger is a proxy for the state of environmental sustainability in the country. Judging by the status of the tiger — and other magnificent animals — we would have to discount some of the impressive economic growth that India has achieved in the last decade. How could this have happened? Far and away, the first cause of the crisis is poaching to satisfy the demand for tiger products for traditional oriental medicine in China and other parts of East Asia. Incidentally, poachers have also turned to the remaining 300 or so Asiatic lions in the Gir forests of Gujarat because lion parts are indistinguishable from tiger parts in the East Asia markets.

The second reason is that in the past decade the areas inhabited by tigers have fallen by two-fifths, with intense competition for land, water and forests, and the endless encroachment of villages onto protected land. The lack of political will to give adequate priority to the preservation of the natural environment has fuelled the destruction of the environment.

What is worse, there are now plans to legalise the sale of tiger parts from tiger farms in East Asia. Lobbyists for legalising tiger trade argue that flooding the market with farmed animals will reduce the price of tiger and therefore the profits from poaching. A cited analogy is that people don't hunt wild turkeys for Christmas as supermarkets overflow with farmed supplies. But in the case of tigers, opening even limited trade will only increase hunting of tigers in the wild. The reason is that poaching in India (by poisoning, or with steel traps) costs only $40 and $60 a tiger, while maintaining one in captivity in East Asia costs $2,000-4,000. That cost difference makes it improbable that wild-tiger parts will be priced out.

So there really is no alternative to confronting poaching for tiger parts for use in oriental medicine. Campaigns need to be strengthened highlighting the irreversible damage this practice causes to wild tiger populations. Indeed, the World Federation of Chinese Medicine Societies has declared that tiger parts are not necessary in traditional medicines — alternatives are available and effective.

Also, India needs stronger efforts in conserving habitats. Four decades ago, the Indian government initiated Project Tiger, involving protected areas and wildlife corridors to assure a genetic pool, protective measures and enforcement. This led to a dramatic population recovery, but only for a time, as commitment languished.

Going forward, there needs to be a strong effort to ensure adequate numbers of protection staff with motivation and adequate remuneration for facing daily hazard at the hands of poachers. They also need the supply of modern inputs in conservation. Models of conservation need to be modernised, bringing in commercial operators working alongside or under official wildlife agencies.

Forest-based communities also need a stake in protecting the tiger. This would mean turning what is often seen as a liability into an asset and a source of income for local communities. There are worldwide lessons, even if limited — from Costa Rica, Singapore, South Africa, and India itself — on how eco-tourism can simultaneously bring environmental protection and prosperity. Importantly, Prime Minister Manmohan Singh has taken a personal interest in the cause of the tiger and has established a new National Tiger Conservation Authority.

Strong follow-up action is required at all levels. These efforts also call for sizable financing. Indian corporations, such as Tata, and the Asian business diaspora could help in the investments. Corporations featuring the symbol of the tiger, such as Exxon Mobil (they have a Save the Tiger fund), Kellogg or Asia Pacific Breweries with Tiger beer, as well as international financial institutions, could support the cause. The drive could get a boost if illustrious personalities lend their prestige to it — imagine a campaign fronted by Tiger Woods.

Extinction of the Royal Bengal tiger, lord of the Indian jungle, would be an irreversible loss to India's heritage and a signal of the environmental dangers of the current development path. It is urgent that India and the world community weigh in on a concerted programme to save the tiger.

The writer is with the World Bank. Views expressed are personal.

INDIAN EXPRESS 13.9.07

'MP mounting pressure on Centre to include translocation proposal in agenda of NBW meeting'

State gets ready to fight relocation of lions

BASHIR PATHAN
GANDHINAGAR, SEPTEMBER 12

EMBATTLED in the recent Gir lion poaching incidents, the Gujarat Government is preparing for another salvo of Madhya Pradesh to relocate some Asiatic lions to Kuno Palpur sanctuary in the neighbouring State. According to Sachivalaya sources, the MP Government has once again started mounting pressure on the Centre to include the controversial proposal of translocation of Gir lions in the agenda of National Board for Wildlife meeting, to be held in New Delhi on October 8.

The meeting will be chaired by Prime Minister Manmohan Singh who is also the chairman of the NBWL. Among others, the chief wildlife wardens of all the States are



members of the Board. "We are aware that the recent unfortunate poaching incidents may prompt Madhya Pradesh to reiterate its demand to translocate some Gir lions to Kuno Palpur sanctuary, and representatives of the neigbouring State may even rake up this issue at NBWL's meet. But, we will stick to our earlier stand. We will not shift Gir lions to Madhya Pradesh," asserts Forest Minister Mangubhai Patel.

Patel told *Express Newsline* on Tuesday that the State Government had already informed the Union Ministry for Environment and Forest that the MP proposal for relocation of Asiatic lions was not acceptable, and that "our government has already intensified measures to protect the wild cats in and around the Gir sanctuary". Gujarat PCCF (Wildlife) Pradeep Khanna, who will attend the NBWL's meeting in Delhi, said he would hold the government brief and resist any move by his MP counterpart to raise the Gir lion issue during the deliberations at the October 8 meeting. He said that even at the June 2006 NBWL's meeting, Madhya Pradesh had raked up this issue which he and another NBWL member from Gujarat G A Patel had vociferously resisted the MP's move.

Asked, Khanna said there was no denying the fact that three poaching incidents, two in Gir and one in Bhavnagar district, had been reported over two months ago in which as many as eight Gir lions were killed. But, the State Forest Department had then swung into action and booked the culprits involved in the incidents. Not only this, the department has taken quick steps to check such incidents and protect the Asiatic lions.

Among the protective measures initiated by his department, Khanna said that of the total 300 posts of "vanya prani mitras" (wildlife friends) sanctioned by the Government, 180 were already recruited, besides 100 new posts of forest guards have been filled up.

Moreover, as many as 100 motorcycles, 10 jeeps equipped with wireless sets and 75 walkie-talkie handsets have been purchased, while the department is in the process of purchasing 25 .12 bore guns and 10 revolvers for its staff protecting the Gir sanctuary, he said.When contacted, former NBWL member and chief wildlife warden G A Patel said there was no question of the State conceding to the demand of shifting Gir lions to Madhya Pradesh because similar experiments had miserable failed in the past.

"Since Kuno Palpur sanctuary has had some tigers, it's not advisable to shift Gir lions there, as there are bound to be frequent clashes between the two carnivores over territories. It has been observed that tigers and lions can never co-exist", he contends.

INDIAN EXPRESS 11.9.07

POLL MODE | Forest department airs concern as Congress and BJP promise over 500 sq km of forest land to tribals

Votebank politics encroach on forest land

ABHISHEK KAPOOR
GANDHINAGAR, SEPTEMBER 10

We have reports of cases where families have split and encroached over 10 hectares of land between them. Once a territory becomes disputed, they cannot be evicted under the new law till a settlement is reached

M L Sharma
Principal Chief Conservator of Forests

BOTH the BJP and Congress, in a bid to woo tribal votes, are promising over 500 square kilometre (sq km) of forestland in the State to the tribals under the yet uncertain Scheduled Tribes (Recognition of Forest Rights) Act, 2006.

Foresters fear the figure could touch 1,000 sq km, as new encroachments aimed at seeking benefits from the Act have been taking place since the Bill was passed last year. This would mean the thinning forest cover in Gujarat getting reduced by three to seven per cent. The Forest department has now launched a survey to ascertain the extent of the problem.

The 2006 Act recognises the right of ownership of forestland to forest dwellers. The premise is that forests are the ancestral lands of tribals, and rightfully belong to them.

What rattles the forest department is the date fixed as cut-off for deciding the ownership rights. Against October 1980 (as fixed by the Forest Conservation Act, 1980), the 2006 Act includes all forest cultivation done till December 13, 2005.

"We have reports of cases where families have split and encroached over 10 hectares of land between them. Once a territory becomes disputed, they cannot be evicted under the new law till a settlement is reached. We are scared about that," said Principal Chief Conservator of Forests M L Sharma.

A department study carried out in 2003 on encroachments in the Vadodara circle alone, had found post-1980 cultivations on over 23,000 hectares of forestland. This amounted to over 10 per cent of total forest area of Vadodara circle that includes the districts of Vadodara, Panchmahals, and Dahod. All that stands to be regularised and out of forest once the 2006 Act is implemented.

Such is the electoral potential of the issue that while the government department evicts tribals from fields, Chief Minister Narendra Modi has actually announced that would launch a Satyagraha if the Central government does not move fast on the issue.

Leading the Congress party's fight in the State is Sabarkantha MP Madhusudan Mistry, with his NGO already having collected over 16,000 applications from tribals in the districts of Sabarkantha, Banaskantha, Panchmahals and Valsad.

Though not sure of the exact number of beneficiaries as also the area of land that would go out of forests, Mistry is of the firm opinion that the forest department fears are unfounded. "Claims are not final. There is a mechanism in the Act through which they would be verified," he says.

Foresters are also cagey over the cut-off date getting postponed again. " Post-independence, almost every successive decade had a fresh cut-off date. 1980 was a watershed owing to the Forest Conservation Act, but this new Act brings cultivations of subsequent 25 years into its fold," say senior divisional officials involved in the survey.

Mistry, however, is sure that this is a one-time affair. "The Act is very clear on this. It is a one-time exercise to settle the issue of encroachments by recognising age-old occupations. That is why it provides for the inclusion of cultivations that go three generations ago."

Mistry also said there would be no reduction in forest area as provisions exist under 1990 guidelines of the central government that the Forest department be compensated for the lost land from the State government land bank that can then be developed into a forest through plantations. But foresters maintain that there is no such provision in the new Act, and that it supersedes earlier rules and acts.

INDIAN EXPRESS 12.9.07

Time to end subsidy on commercial use of water: PM

PRESS TRUST OF INDIA
NEW DELHI, SEPTEMBER 11

HIGHLIGHTING the drawbacks in providing free power to farmers, Prime Minister Manmohan Singh on Tuesday said the Government cannot continue to subsidise economic and commercial use of water.

"Providing free power to farmers has encouraged excessive use of pump sets and excessive drawing of ground water. If there is economic pricing of power, there would be some incentive for conserving ground water," he said inaugurating the National Ground Water Congress here.

Water conservation and management could be better served through appropriate incentives and penalties, Singh said adding "we cannot continue to subsidise the economic and commercial use of water". "There are related policies that must be corrected to ensure water conservation, especially ground water," he told a gathering which included Water Resources Minister Saifuddin Soz, water experts and planners.

Observing that human kind has not done enough to replenish, conserve and safeguard the sources of water supply, he said "on the contrary, given the threat of climate change and global warming, we face the real prospect of reduced supply of water".

"This threat is of particular concern to us in India since we have depended on glaciers for our water supply in this part of our sub-continent," he said.

Soz said over-exploitation and contamination of ground water in some areas has led to apprehension about its sustainability. Noting that the challenge of water scarcity could only be addressed in an interdisciplinary, holistic and consensual manner, the Prime Minister regretted that the country has not paid adequate attention to water both as a public and economic good.

Today there is even a greater need to address the challenge of water scarcity with a much greater sense of urgency, he said and asked the Advisory Council on Artificial Recharge of Ground Water to create widespread national awareness on an equitable, efficient and environmentally sustainable water policy.

INDIAN EXPRESS 8.9.07

On water's edge

THIS month the Supreme Court is going to consider the Punjab Termination of Agreements Act (2004), the matter of control over head-works in Punjab and the issue of the Hansi-Butana canal. All these refer to the ongoing disputes between the states of Punjab, Haryana and Rajasthan over the sharing of river waters. It is not as if there is a shortage of water supply. Even conservative estimates suggest that the Ravi-Beas system has 14.37 MAF of water which, if used judiciously, is adequate for the needs of these three states.

What is needed to manage these resources well is some kind of institutional mechanism, which we lack as of now. The various versions of the Inter-State Water Disputes Act, 1956, have only created recriminatory conflicts between states. This act has resulted in great difficulties vis a vis the states evolving a consensus on what is appropriate sharing between them. Once such a consensus does get evolved, they routinely renege on it, much as Punjab and Karnataka have done. Approaching the courts as a last resort, despite Article 262 of the Constitution empowering Parliament to make such disputes non-justiciable, has often resulted in courts refusing to adjudicate in a timely manner. The search for a wise solution, when extended unnecessarily, is most unwise.

On balance, the government of India has no hesitation in appropriating the resources of both private individuals and various states with little thought to notions of natural justice and fair play. Yet where water resources are concerned, it prefers to merely wring its hands and bemoan its helplessness. It consistently refuses to intervene in the matter, saying that this is a conflict between states that the provincial governments will have to resolve and where the central government can only play an advisory role. Similar tactics were employed in the not so distant past by the British colonial government over conflicts between various groups in India. Does not the current method of the government of India in respect of water resources too smack of the

Contd. on pg 5

On water edge...

Centre needs to abandon its wait-on-the-sidelines policy on inter-state water sharing. It must set up an institutional mechanism, both to resolve disputes and to increase efficiency of water use

policy of divide et impera?

What is needed is for the government to abandon its wait-on-the-sidelines policy. It must intervene effectively to set up an institutional mechanism, both to resolve disputes and to increase the efficiency of water use. Currently it is fashionable among government circles to say that one way to increase such efficiency is to privatise institutional mechanisms. But the "public private partnership model" cannot be a panacea for all problems. Experiences such as the Cochabamba water project of Bolivia show that wholesale privatisation of water can even have dangerous results. When water bills in Cochabamba increased by 200 per cent as a result of privatisation, it sparked a civil uprising that forced the government to again put the water system under public control. Given the sensitive nature of the commodity, a public regulatory authority would be very important. Pricing mechanisms could be worked out in consultation with the users.

Maharashtra is the first state in the country to take the initiative in setting up a regulatory authority to manage waters in an integrated river basin approach. The Maharashtra Water Resources Regulatory Authority Act 2005 provides that Water User Entities including Water User Associations, managing water resources on behalf of a group of entitlement holders, may be issued an Aggregate Bulk Entitlement. It also provides for Individual Water Entitlements to be issued for the construction and operation of individual lift irrigation schemes from surface water sources, bore-wells, tube wells or other facilities for extraction of sub-surface water. For the first time in India, the law empowers the authority to create mechanisms for trading water entitlements.

This act has been criticised among other grounds on the fact that it talks about equity only for the landed farmers and not about water rights for the landless and also that the creation of tradeable water entitlements could work against the weaker sections of society. These points could be debated and resolved. The more important issue is the recognition that water is a resource that requires regulation at the level of the government.

Where inter-state water sharing is concerned, we need today a Federal Water Resources Authority that considers the reasonable concerns of all user states and then comes to a final decision. The tribunals of today set up under the authority of Article 262 of the Constitution have outlived their value and their unending deliberations only mean that on one hand much useable water continues to flow into the sea and on the other hand the water rich states practice newer forms of a dog in the manger policy even when excess water use is destroying the fertility of their fields.

Rajvlochan is the author of 'Farmers suicide: facts and possible policy interventions'. He teaches contemporary Indian history at Punjab University, Chandigarh.

BUSINESS LINE 10.9.07

WATER MANAGEMENT IN EUROPE

Tapping the sources right

The water industry in Germany exemplifies the highest standards of performance and efficiency among the EU member-States. The consumers are well served, especially when it comes to drinking water quality and security of supply. Germans are able to do this due to the high technical standards of distribution and treatment.

Mohan Murti

On Sunday, last week, when I called my parents living in Palakkad, Kerala, I was told that while the south-west monsoon rains were lashing outside, drenching the dry earth with that intoxicating smell, the water taps at home were dry. They had not had water supply in the house for six hours — almost all of the forenoon.

Tell apart a catastrophe — any catastrophe — the humankind is facing today: Famine, civil war, AIDS, malaria, land mines. Every single one of these becomes insipid in contrast with the problem several countries, including India, are facing *apropos* water — from availability of clean, safe water to deadly water-related maladies.

EUROSCAPE

HIGH EFFICIENCY OF THE WATER INDUSTRY

If we look at the water supply and wastewater disposal industry of EU member-states, the water industry in Germany exemplifies the highest standards of performance and efficiency and it is held in high esteem among its customers.

The consumers in Germany are superbly served, especially when it comes to drinking water quality and security of supply. Disruptions of supply without adequate prior notice are unknown in Germany.

In my 15 years in Germany, this has happened only once, for 10 minutes, and with 30 days prior notice! Germans are able to do this due to the high technical standards of distribution and treatment and the excellent condition of networks.

Also, in the field of wastewater treatment, Germany is one of the top performers in Europe. The wastewater in Germany is 95 per cent tendered to biological treatment in sewage plants pursuant to the highest EU standard.

The water supply utilities have by far the lowest network losses in a European comparison.

Drinking water of an excellent quality is available to the citizens at all times. The prices for drinking water and the wastewater recycling charges have remained stable for several years now.

Water charge increase — which seldom happens — is in line with the increase in cost of living. In 2006, Germany supplied around 700 million cubic metres of raw water out of 70 reservoirs and delivered almost 500 million cu m of drinking water to 80 million citizens without interruption.

THE DANISH WATER STORY

In Denmark, groundwater is almost the only source of drinking water. For many years, research, planning and careful implementation concerning the exploitation and protection of groundwater and water resources have been one of the main activities of the local communities, town planners, municipalities and the federal government, in Copenhagen.

In the early 1980s, investigations brought to light the problems associated with landfills, industrial facilities and intensive farming, including use of pesticides, which initiated a series of actions including stringent legalisation related to pesticide-free farming, protection of water resources, its prudent use and careful disposal and recycling.

The foundation of these activities is the National Centre for Groundwater and Well Data, which has been in function since the worlds first Danish Water Supply Act was formulated in 1926. The database now contains digital well log data from more than 300,000 bore-wells in Denmark. In addition, Geological Survey of Denmark and Greenland (GEUS) is the topic centre for Danish Groundwater Monitoring, including the operation of an early warning system for pesticide leaching, and giving the annually updated status of groundwater quality and quantity.

THE REGULATIONS

Within the water resources area, the Danish Water Authority collaborates with research institutes, universities and private consulting companies.

Amazingly, Denmark allocates annually 20 per cent of its national budget on water resources.

As with most things in life, there are regulations around mineral waters, in Europe. Water is not just water, but it is categorised. It must fulfil specific criteria to be sold as mineral water or to belong to another of several specific categories. These regulations are mostly specific to each country, within Europe.

Germany states different maximum levels of minerals and trace elements for drinking water (including tap water) and mineral water. Mineral water, in most of West Europe and Germany, must be bottled directly at the source, and may not be altered.

Contd. on pg 7

The World Bank and the International Monetary Fund are promoting water privatisation in the developing countries, opening the door for transnational corporations to share knowledge and profit from water treatment technologies.

WATER IS A 'GOOD'

For several years now, the World Bank and the International Monetary Fund are belligerently promoting water privatisation in the developing countries, opening the door for huge transnational water corporations to share knowledge and profit from water delivery and waste water treatment technologies.

Water is clearly a 'good' in the General Agreement on Tariffs and Trade (GATT). Article 11 already rules out any quantitative restrictions on the export of a good, but allows tariff measures, such as taxes or dual price systems. The Europeans have been asking the inclusion of drinking water in the GATS agreement.

They have large multi-national corporations (MNCs) which are involved in privatising municipal water services around the world.

It is believed that when the Romans came to Germany, they often saw a golden glitter in lakes and rivers. Closer examination revealed coins and bracelets, thrown in by early settlers.

This was done to calm and express gratitude the Gods who were believed to live in the water.

Even to the present day, children, adults, politicians, the general public in Germany and rest of West Europe continue to have the same revere for water resources.

This admiration for water is perhaps based on the assertion that water has faultless memory and is eternally trying to get back to where it was.

Only man's intelligence, ingenuity and will, can make it run uphill or, flow downhill. So, if there are yet nations and societies left in this new millennium without water, it is those inhabitants to blame. Sadly, in this context, India is a classic archetype.

(The author is former Europe Director, CII, and lives in Cologne, Germany. Feedback may be sent to mohan.murti@t-online.de)

Development Issues

INDIAN EXPRESS 29.8.07

A job of looting

How the rural employment scheme in Orissa is rendered meaningless

THE National Rural Employment Guarantee Act (NREGA) was enacted to enhance the security of households in rural areas by providing at least a hundred days of guaranteed wage employment in every financial year to every household. Orissa is one of the poorest states with a very high percentage of rural population living in abject poverty and chronic hunger. It is only natural to accord top priority to this state in terms of fund allocation. Therefore Orissa was allocated Rs 890 crore under the NREGA and the state was able to spend Rs 733 crore during 2006-7.

So far so good. Now a survey conducted in Orissa's six poorest districts has revealed that out of this Rs 733 crore spent under NREGA , more than Rs 500 crore has been siphoned and misappropriated by government officials. This survey was conducted by a centre I am associated with, the Delhi-based Centre for Environment and Food Security. It surveyed 100 villages in the six districts of Kalahandi-Bolangir-Koraput region. They were Bolangir, Nuapada, Kalahandi, Koraput, Nabarangpur and Rayagada.



INTERVENTION

PARSHURAM RAI

The Government of Orissa claims that it provided 7.99 crore man-days of employment to 13,94,169 households during 2006-7. Our back-of-the-envelope calculations suggest that less than 2 crore man-days of employment has been provided on the ground and more than 6 crore man-days of employment has been accounted for only on the pages of false job cards and fabricated muster rolls.

As per the claims of the Orissa government, every needy and demanding family in the state was given an average of 57 days of wage employment during 2006-7 and not a single needy and demanding household was denied wage employment in the 19 NREGA districts of Orissa. The CEFS survey, however, has revealed that actually not more than five days of average employment has been given to each of the needy families in 19 NREGA districts of the state and large number of such families were denied employment.

We found that the current level of hunger, poverty and deprivation in Orissa's KBK region is as deep, demeaning and dehumanising as it ever was, despite the so-called successful implementation of NREGA. We could not find a single family in the 100 sample villages who had actually got 100 days of wage employment. We found very few families who had got 40-60 days of wage employment. The rest of the families managed mostly between 5 to 21 days, if at all. However, online job cards of most of these households have false wage entries. It was in this way that Orissa was shown to have "successfully" spent Rs. 733 crore and provided about 8 crore man-days of employment.

It is impossible to believe that this open loot can be organised without the active connivance of the state machinery. The NREGA has various inbuilt vigilance mechanisms and it is not possible to perpetrate this enormous fiddle unless it is participatory and organised.

The writer is director, Centre for Environment & Food Security, Delhi
parshuramray@yahoo.com

TIMES OF INDIA (A) 7.9.07

State panel to study energy conservation

Rajiv Shah | TNN

Gandhinagar: The Gujarat Energy Development Agency (GEDA), the sidelined state government body meant to encourage alternative sources of energy — solar, wind, biogas — is now talking about 'energy conservation'. Gujarat government appears keen to groom GEDA for working to 'conserve' energy produced from conventional sources.

One can already see a sharp departure from Chief Minister Narendra Modi's euphoria towards turning the state capital into a solar city and plans to build a gobar bank in each village to develop a major alternative source of energy in rural areas.

Instead, the state government has decided to set up a State Energy Efficiency Committee with GEDA as the nodal agency for energy conservation.

The reason for the major shift is not far to seek. Despite a large number of MoUs with entrepreneurs involved in alternative sources of energy ever since the September 2003 Vibrant Gujarat business meet, the energy department bureaucrats now think that these just cannot work.

A senior official said, "At the most, these can satisfy three per cent of the state's energy needs that too after a huge investment." Gujarat has a potential of 2000 MW of wind energy while the production is just 260 MW, most of which is captive in nature.

ALTERNATIVE STEP



Gujarat has a potential of 2000 MW of wind energy while the production is just 260 MW, most of which is captive in nature.

In fact, many such alternative sources were not even recalled at the two-day workshop on 'Raising th e profile of energy efficiency in Gujarat', which began on Thursday and was sponsored by USAID, which supports energy conservation programmes.

In 2003, the Modi government signed up an MoU with Paurcur Energy and Infrastructure Ltd run by an NRI, Paramani Shah, to set up a 100 MW cow dung-based power plant in Banaskantha at the cost of Rs 1,500 crore. The MoU was only worth a laugh and officials now are scoffing at the very idea of developing gobar gas plants in every village.

In the later two summits, the government signed up MoUs with Suzlon and Enercon for developing wind energy farms in coastal Gujarat, especially Kutch. A senior official said, "The proposals are in implementation stage. Even if put into effect, the energy produced cannot be more than 20 to 25 per cent of the actual capacity."

The Gandhinagar Sachivalaya, which was proposed as a model for solar energy in India, will now have to be satisfied with energy conservation measures. The ones like, replacing conventional tube lights by T-5 tubelights, controlled operation of lifts and air conditioners, replacement of halogen fixtures by what are called sRGB fixtures in the Assembly hall, replacement of 250W sodium fixtures by 150W metal halide fixtures in street light. All this would 'save' energy worth Rs 64 lakh per annum.

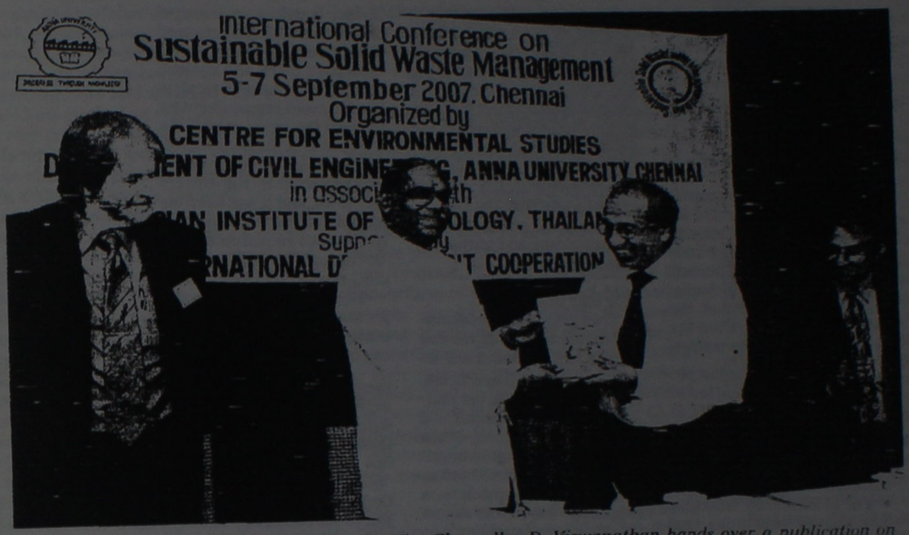
USAID India director Glenn Whaley declared his full support to the energy saving idea put up in the new Gujarat Energy Action Plan's proposal for a State Energy Efficiency Committee. New chief secretary Manjula Subramaniam promptly seconded it.

rajiv.shah2@timesgroup.com

HINDU 6.9.07

Deadline for local bodies to follow waste management rules

Call for campaign on source reduction, reuse and composting



TOWARD ZERO WASTE ERA: *Anna University Vice-Chancellor D. Viswanathan hands over a publication on the proceedings of a conference on sustainable solid waste management in Chennai on Wednesday to R. Sethuraman, Advisor, Central Public Health and Environmental Engineering Organisation. William Hogland, Professor of Environment Engineering, University of Kalmar (left) and C. Viswanathan, Professor and Principal Investigator, SIDA-ARRPET, Asian Institute of Technology, Thailand, are in the picture.* — PHOTO V. GANESAN

Staff Reporter

CHENNAI: The Union Ministry of Environment and Forests will soon issue a notification making it mandatory for all local bodies to adhere to the Municipal Solid Wastes (Management and Handling) Rules, 2000, by December 2008, according to R. Sethuraman, Adviser, Central Public Health and Environmental Engineering Organisation, Ministry of Urban Development.

He was inaugurating a three-day international conference on sustainable solid waste management, organised by the Centre for Environmental Studies, Department of Civil Engineering, Anna University, and the Asian Institute of Thailand here on Wednesday. Swedish International Development Co-operation Agency is supporting the conference.

Though the deadline for implementation of the rules was December 2003, hardly any urban local body had implemented it. Only Namakkal in Tamil Nadu and Suryapet in Andhra Pradesh have achieved 100 per cent collection and transportation of solid waste, he added. The Ministry of Environment and Forests is revising the rules at present, he said.

Mr. Sethuraman said that this was the status even as domestic and trade wastes were being thrown out on the streets, construction debris was left unattended and untreated bio-medical wastes dumped into the municipal waste stream without adhering to the bio-medical waste handling rules. Industrial wastes were disposed of in open areas or in municipal landfill without treatment, he added. Segregation of waste at source was lacking, he lamented.

The waste treatment processes would need to shift towards recovery of recyclables and energy generation, he said, adding that segregation at source with two bags needed to be promoted so as to enable improvement in the quality of raw waste from households.

Professor of Environmental Engineering at University of Kalmar in Sweden William Hogland said that 95 per cent of all solid waste in the world was landfilled or dumped. Incineration was the highest in Switzerland — 80 per cent, biological treatment was highest in France at 22 per cent and the United States topped the list with 75 per cent of sanitary landfilling of wastes. Japan was burning 72.8 per cent of its wastes followed by Denmark — 70 per cent.

He pointed out that a majority of landfills in Africa, Asia and South America were open dumps.

He said that the future of waste was in going for zero wastes, using resources in cleaner and economical ways, achieving eco-efficiency in production of goods with less energy and fewer natural resources. There was a need for eco-cyclic thinking and a closed loop philosophy, Prof. Hogland said.

Holistic approach

Anna University Vice-Chancellor D. Viswanathan said a holistic approach was required for efficient waste management based on the generators taking the responsibilities for their own wastes.

Waste management programmes should include strong public education campaigns on source reduction, reuse, recycling and composting, he said.

Director of the Centre for Environmental Studies K. Thanasekaran and Assistant Professor Kurian Joseph spoke.

TIMES OF INDIA (m) 30-8-07

State fails to reach PM's aid to farmers

TIMES NEWS NETWORK

Nagpur: In August 2006, prime minister Manmohan Singh, in a bid to stem the misery of Vidarbha's debt-ridden farmers, committed Rs 3,750 crore to assist them. One year later, most of this assistance has still to reach the needy.

A report of the Comptroller and Auditor General of India exposes the inefficiency and couldn't-care-less attitude of the state bureaucracy, which has resulted in inadequate implementation of the PM's relief package. Even the most fundamental measures, such as seed distribution programmes and allocation of funds for farm inputs and livestock have not been carried out according to target.

The CAG auditors filed the exhaustive report after a survey of 18 talukas in Vidarbha. The survey concludes that crores of rupees remain unspent, and in some cases have been misused by officialdom. For example, an explanation has been sought by CAG on why Rs 5 crore, meant for feed and fodder supply to farmers, was deposited in two nationalised banks, with the state pocketing an interest of Rs 14.52 lakh on it.



IN THE LINE OF FIRE: The CAG has demanded an explanation for inefficiency and corruption from the state

The agriculture department's casual approach too has come in for fire. Because of incorrect estimation by officials, cultivators failed to get their assured quota of subsidised seeds at the beginning of the sowing season. "Against a demand of 84,119 quintals of seeds, only 31,111 quintals were supplied," the report stated. In other words, there was short supply of seeds to the tune of 63% last year."

"The farmers then have to buy seeds from the market, which are both expensive and of poor quality," an official said. "The PM's package has set aside Rs 180 crore exclusively for seed distribution for a three-year period, but the farmer is still at the mercy of the market and private seed manufacturers.

What's more, the agriculture officers have miscalculated the seed requirement for the next two years as well. "In the case of a major commodity like wheat, no requirement was projected by the officers for '08-'09, and it has been observed that there is a decrease in the seed requirement for '07-'08 and '08-'09," said the CAG report.

Equally appalling is the performance of the officials assigned the task of providing basic inputs and implements to 60,000 select farmers in the six Vidarbha districts with less than six hectares of land and an annual income not exceeding Rs 20,000. "Scrutiny of records reveal that inputs and implements worth Rs 1.33 crore were lying undistributed in eight of the 18 talukas surveyed. Though the agriculture officers defended their action, saying that these could not be distributed because of the farmers' failure to contribute their share of the subsidy, this reply is not tenable," the CAG report stated.

nitin.yeshwantrao@timesgroup.com

HINDU. 3.9.07

Agriculture: where India and China stand

Pallavi Aiyar

It is increasingly common in India to cast a covetous eye over the Himalayas towards China's glittering cityscapes with their multi-lane highways and soaring skylines. Thus Mumbai aspires to be the Indian Shanghai while New Delhi hopes the Commonwealth Games can spell the kind of benefits for its fortunes akin to those brought by the Olympics to Beijing.

However, the wakeup call that China represents to India is far from limited to its showpiece urban centres. Even more pertinent from an Indian point of view is a comparison of the agricultural sectors of the two neighbouring countries.

Both have traditionally been agrarian economies and well over half of their billion-plus people continue to depend on land for their livelihood. Given their large populations and histories of famine, India and China also share similar concerns on issues such as food security.

However, while India's agricultural sector is projected to grow by about 2.5 per cent this year (a slide from the 2.7 per cent growth in 2006), China's has been steadily growing at between 4 and 5 per cent over the last 15 years. By 2005, China had in fact emerged as the world's third largest food donor.

The two widest agriculture-related discrepancies between India and China lie in the diverging productivity levels of various crops and in the differential mix of crop and non-crop segments in the overall composition of the farm sector.

According to the Food and Agricultural Organisation (FAO), the average yield of rice in India between 2003 and 2005 was 3,034 kilograms per hectare. In contrast, the comparative figure for China was more than double at 6,233 kg/ha. For wheat the corresponding figures were 2,688 kg/ha for India compared to 4,155 kg/ha for China, while for rape and mustard India averaged 909 kg/ha to China's 1,778 kg/ha.

The data on the trend rise in yields in the 15 years leading up to 2005 are also telling. For rice the trend rise over this period in India was only 1 per cent, less than half of China's 2.1 per cent. According to statistics from the International Rice Research Institute, India produced 124 million tonnes of rice compared to China's 186 million tonnes in 2004, despite having almost double the area under paddy cultivation (42 million hectares vs. 28 million hectares).

Contd. on pg 11

Where India and China stand...

How did China manage to outstrip India in agriculture when the two countries were more or less on a par on most parameters 25 years ago?

Regarding rape and mustard, the trend rise in China marked an even larger stride — 3 per cent compared to the India's mincing step forward of 0.6 per cent. Other crops such as wheat and groundnut reveal similar trends, with China well in the lead.

The widest divergence between India and China, however, is in the profitable horticultural sector with the production of fruits and vegetables in China leaping up from 60 million tonnes in 1980, roughly comparable to India's 55 million tonnes at the time, to 450 million tonnes in 2003, way ahead of India's corresponding 135 million tonnes.

China's added advantage lies in the more diversified composition of its agricultural sector, with animal husbandry and fisheries accounting for close to 45 per cent of the total in 2005, compared to less than 30 per cent in India. China has thus clearly developed a more diversified set of instruments than its southern neighbour for increasing net farm incomes.

The key question that arises is why and how China has managed to outstrip India in agriculture when 25 years ago, the two countries were more or less on a par on most parameters. The latest report by the Economic Advisory Council to India's Prime Minister, "Economic Outlook for 2007-08" has a special section on agriculture and points out that the traditional excuses for India's substandard performance in the farm sector are not only tired but inadequate.

Written by a team headed by C. Rangarajan, the report points out that Indian agriculture is placed favourably when compared to China in terms of quantity of arable land (161 million hectares vs. 130 million hectares), irrigated land (55.8 million hectares vs. 54.5 million hectares), average farm size (1.4 hectares vs. 0.4 hectares) and farm mechanisation (15.7 tractors per 1000 hectares vs. 7 tractors per 1000 hectares). Thus most of the usual excuses for India's poor agricultural performance do not hold up when it is compared to China.

The reasons

According to Professor Huang Jikun, Director of the Centre for Chinese Agricultural Policy, the reasons for China having outperformed India in agriculture are threefold: technological improvements accruing from research and development, investment in rural infrastructure and an increasingly liberalised agricultural policy.

In China, the Central government invested RMB 12 billion ($1.5 bn) in agricultural research in 2006, up from RMB 4 billion in 1995. The country currently has over 1,000 R&D centres devoted to agriculture and there is a huge push towards developing new strains of plants. Some two-thirds of all cotton grown in China is BT cotton and nearly 100 per cent of paddy is of a modern variety.

According to the *China Agricultural Year Book 2005*, the Chinese authorities received and assessed as many as 2,046 applications for the registration of new plant varieties in the five years between 1999 and 2004.

In contrast, S. Ganesan, advisor to the Consortium of Indian Farmers Association reveals, despite India having the largest number of agricultural scientists on the government payroll in the world — over 30,000 — their research track record has been so abysmal that India's current agricultural productivity is roughly equal to what China achieved in the mid-1980s.

Production of grain and pulses has in fact been stagnant for a decade and there has been virtually no breakthrough in seeds or yield since the Green Revolution. Mr. Ganesan adds that, far from developing new strains, the number of field crop varieties released by the Indian Council of Agricultural Research (ICAR) actually fell by 50 per cent between 1997 and 2001, despite the fact that there was a sharp and sustained increase in funding for the organisation.

One reason for the poor results of India's R&D in agriculture is the state of the country's agricultural universities. Mr. Ganesan cites a report according to which 90 per cent of the Punjab Agricultural University's budget is eaten up by staff salaries with only 3 per cent going to research.

In contrast, as pointed out by Professor Huang, most agricultural research centres in China must use Central government funding purely for research. Funds relating to salaries and other administrative incidentals must be covered by funds generated by the centres themselves. The centres and their scientists are thus encouraged to engage in joint ventures with private sector companies to form commercial spin-offs from their research.

"In China, even public sector organisations today must act somewhat like the private sector," explains Professor Huang. Thus more and more research staff are being hired on a contract basis with pay linked to research performance. Moreover, salaries for those who perform well have risen several-fold in the last decade — from around $300 to $1,500 a month for a full professor.

But research and technological advances by themselves would have been inadequate to lift Chinese agriculture to its present level of development, says Professor Huang. Investment in rural infrastructure, in particular roads as well as storage and other marketing facilities, has also been crucial, he says.

According to Xinhua news agency, China invested RMB 151.3 billion (almost $20 bn) in the building and reconstruction of 325,000 kilometres of rural roads in 2006 alone.

In contrast, the main form of government assistance to farmers has been through subsidies rather than investment in India. Unlike India, China does not provide its farmers with subsidies for fertilizers or power. Professor Huang says that of the RMB 340 billion ($44.7 bn) spent on rural agricultural investment by the Chinese government in 2006, only about 5 per cent was by way of subsidies.

"There is some debate regarding subsidies and their utility in China but the government realises that on the whole subsidies are against market reforms. They distort the market as well as reduce resource efficiency," he says.

Lastly Professor Huang credits China's relative agricultural success to an increasingly liberalised farm policy with a focus on "efficiency as much as on equity." Thus not only is China sharply reducing its stocks of surplus grain, the government policy is also moving away from an exclusive emphasis on self-sufficiency to a considered leveraging of competitive advantages.

Professor Huang takes soybean as an example. In the 1990s, China imported no soybean at all despite the lack of domestic suitability for its cultivation. In contrast, by 2005 the country imported 26 million tonnes of the legume, 11 million tonnes more than it produced locally. "The demand for soybean is growing but rather than meet it domestically we have realised it is better to import it. We should focus on what we are most suited to producing instead," Professor Huang concludes.

Unless India is serious about learning from China's exampie in agriculture, particularly with regard to improved R&D and more pragmatic agricultural policies, it may not be able to meet its targets for the farm sector in the Eleventh Plan period, feels Mr. Ganesan. To illustrate the "fatal ignorance and blunders" that he says afflict the present agricultural establishment in India, he gives an example from the latest edition of ICAR's "Handbook of Horticulture" released in 2006; it recommends the pesticide, endrin, for use in growing bananas. Endrin was, in fact, banned in India and most parts of the world nearly 20 years ago.

INDIAN EXPRESS 7.9.07

This farmer wanted a motorbike

VIVEK DESHPANDE

VIDARBHA'S serious agrarian crisis has been one of the most agonising media stories of recent times. It was this newspaper which first brought the crisis to the fore on November 19, 2002 by reporting the suicides of nine farmers in Yavatmal district within six weeks. Since then it has been consistently reporting on the issue. Media attention has, in turn, prodded the government into action. First came the Rs 1,076 crore package from the state government in December 2005. Later, Prime Minister Manmohan Singh visited the region in July 2006 and announced a Rs 3,770-crore package.

Suicides continued to figure and there were even reports that their number had actually gone up after the PM's package was announced. Most of these reports were based on e-mails and press notes issued by Vidarbha Jan Andolan Samiti, which claimed to be keeping tabs on all the farmers' suicides in the region. As a paper, however, the *Express* chose not to publish them because there were doubts about their authenticity. Others kept reporting the figures without bothering to verify them.

The fact is that the number of agrarian suicides has been coming down of late, largely because of the initiatives announced by the PM in the six worst-affected cotton districts of the region. Steps ranging from the waiver of interest worth more than Rs 700 crore to a crackdown on private money-lenders, taken together, have had an impact. Therefore the claim many in the media continue to make that farmers are still committing suicide in large numbers due to indebtedness, doesn't hold water. Take one such story. It was about a young farmer committing suicide in the bank where he was standing in a queue to receive a fresh crop loan. The suicide was committed reportedly because actual disbursal of payment had got delayed by a few hours. Investigation by this newspaper revealed that the young man was pestering his father to give him the loan money in order to buy a motorcycle. When the father refused to do so, the son consumed poison right in front of the bank. Vested interests sold the story to the media as a farmer's suicide and the media blindly published it prominently.

Activism, bad journalism are distorting facts on farmers' suicides. Good news, good policies get buried

Farmers' suicides have by no means ended, of course, and they still remain cause for concern. But, as we have just reported in *The Sunday Express* (August 26), their numbers are declining. Does this mean the media should not report suicides at all? Ideally no, unless they have been personally verified and only if the story throws new light on the crisis. We also need to understand that the number of suicides cannot be the real index of the severity of the crisis. If that were so, then the question arises as to why just 8,000 out of the nearly 18 lakh farmers in the six worst-affected districts had committed suicide since 2001, when a state government's survey last year found that 4.5 lakh farmers were acutely distressed? Does this mean that the remaining 95 per cent of these 4.5 lakh are agriculturally less distressed? Also to be noted is the fact that only 50 per cent of these suicides belong to the acutely distressed category. The rest belong to the moderately distressed (9 lakh) and non-distressed (3.75 lakh) categories.

Clearly, then, there are reasons other than agrarian ones that trigger suicides. Many farmers end up spending a lot on health care. There are also exacerbating factors like domestic quarrels and indebtedness due to alcoholism. According to a study conducted by the Indira Gandhi Institute for Development Research, while health-related problems were reported in 21 per cent cases, a non-responsive family set-up as well as addictions accounted for 55 and 28 per cent of suicides respectively. Which means that these farmers wouldn't have committed suicide if they did not have to contend with the additional aggravations although it does not mean that they were not distressed for agricultural reasons.

This is not to deny that media reporting farmers' suicides has not served an important purpose. It has woken up a highly urban-centric government to the rural economic crisis. A beginning has been made. Since we have necessarily to depend on the government to address the situation, let us not unduly harass it for the wrong reasons. Let's hold it accountable for the right ones.

In fact, the interests of farmers would be best served by focusing on the real problems dogging them rather than by highlighting unsubstantiated stories of suicides.

vivek.deshpande@expressindia.com

INDIAN EXPRESS 1.9.07

So what have you done about climate change today?



Many old themes and a few good ideas at the climate change talks in Vienna. Sonu Jain listens in

Blowing in the wind

India had better be very serious about its numbers on renewables — green energy from wind, solar and biomass. India's ambitious targets — 30 per cent of the country's energy needs by 2030 — have caught the imagination of the world. During the Vienna conference, the US chief negotiator, Harlan Watson, handed out praise and said it was proof that developing countries were doing their bit. So did the head of the UN panel on climate change Yvo De Boer.

While it is good to aim high, the reality on the ground is not encouraging. We are only at 7 per cent now. True, wind power has assumed a life of its own with India being number four on the list. But the road to renewables is still long. Most policy-makers think 30 per cent is unachievable.

Any volunteers?

The US is always the favourite whipping boy on climate change, having opted out of the Kyoto protocol. Its invitation to the big emitters of the world (including India) in September is being seen as yet another "doing nothing policy". It believes not in mandatory targets for cutting emissions, but undefined, voluntary action. A network of NGOs said in their newsletter here that the trouble with voluntary action is that there aren't enough volunteers!

In contrast, American businesses came up for praise. More than two dozen of the largest US companies have banded together with leading environmental organisations to move a legislation in the US Congress. If passed, this would mean that the US takes on targets to cut carbon emissions by as much as 60-80 per cent by 2050.

To market, to market

Does the Clean Development Mechanism (CDM) foster an unequal world? CDM helps rich nations pay for cleaner, greener technology for the developing world.

It is clearly a market-based tool and the only large channel through which money and technology can flow between the two parts of the world. Experts call it "cherry on the investment pie". In other words, it follows where the markets go.

China and India now have the largest CDM pie between themselves. South Africa has a measly 3 per cent. The other smaller countries have no CDM projects. In short, a robust carbon market is only in countries with a robust market. If this is the only way to solve the climate change problem, it surely does not work for countries that need it the most.

Moo(t) idea

A member from the New Zealand delegation approached the Indian delegation, to set up a meeting. The reason: both countries have cows. New Zealand has moved a proposal that says that green house gases should only mean carbon dioxide. For now, it includes methane too. A major source of methane is belching cows. New Zealand wants cow-rich India to back up its proposal. The Indian negotiators smiled politely but have not said moo to this as yet.

Oil versus coal

The world is truly on track for cutting consumption of oil. Rising oil bills as well as carbon emissions are the reasons. Each time the world gets closer to making more solid commitments on this front, countries like Saudi Arabia and Kuwait start piping in for compensations. They say global warming is because of the market distorting subsidies given to coal. It is the coal lobby that is to be blamed, not oil.

Acts of emission

Experts have begun to take seriously voluntary actions by citizens of developed countries who want to "offset" their monthly household emissions from electricity usage. Some organisations offer services that calculate carbon emissions of an individual and then help them put in money on a project, say in India, that would help save the same amount of carbon. By year end, the International Emission Trading Association is coming out with standards to benchmark these services. This would mean a more organised way of helping a citizen do his bit for climate change.

sonu.jain@expressindia.com

HINDU 6.9.07

APEC summit, global warming, and coal use

The fate of our warming planet hinges on six nations, and five of them meet in Sydney this week.

Jeremy Leggett

Through his long years of greenhouse denial, United Sates President George W. Bush must have been particularly grateful to John Howard. The Australian Prime Minister was quick to join Mr. Bush in refusing to ratify the Kyoto protocol, and has batted for his country's coal interests as trenchantly as Mr. Bush has batted for U.S. coal and oil interests.

Now Mr. Bush has had to deal with the impact on American public opinion of Hurricane Katrina and Al Gore's movie, and can no longer afford to ignore climate change. Mr. Howard, contending with a killer drought, is similarly finding that greenhouse denial is out of bounds. The flow of Australian rivers has fallen by a staggering 70 per cent in recent decades. All Australia's major cities are in drought. The "big dry" in the Murray-Darling basin threatens 40 per cent of food production. Global warming has become an issue in the January elections.

Mr. Howard hosts the Asia-Pacific Economic Cooperation (APEC) summit in Sydney this week. Mr. Bush will be one of the leaders attending. Everyone who cares about the greenhouse threat should train a microscope on their actions. The fate of human civilisation will probably hinge on the fossil-fuel decisions of just six nations, and five of them are members of APEC.

If we are to avoid tipping the planet over a widely accepted danger threshold of 450 parts per million of atmospheric carbon dioxide, we can only afford to burn fossil fuels in a quantity measured in low hundreds of billions of tonnes of carbon. Industry estimates suggest that remaining oil deposits alone exceed this figure, if we include unconventional sources such as Canada's tar sands.

As for coal, the energy industry suggests several thousand billion tonnes remain to be burned. Even if we believe fossil-fuel proponents tend to exaggerate estimates of the size of deposits, it is clear that most of the remaining coal has to stay in the ground if we are to avoid climate catastrophe. Three-quarters of coal reserves are in five nations: the U.S., Russia, China, India, and Australia.

Add Canada, because of the scale of the oil deposits in the Athabasca tar sands, and there you have it: the fate of human civilisation will probably hinge on the resource decisions of just six nations. Those who place their hopes in bolt-on adjustments to the fossil-fuel status quo, notably carbon capture and storage technology, face the problem that mass production of the necessary technology is more than a decade off.

What can we expect of Mr. Howard, Mr. Bush and their fellow coal leaders this week? Mr. Howard has said he will instigate a carbon-trading scheme if re-elected, but will not be drawn on the all-important issue of caps. Mr. Bush opposes an energy bill passed recently in the House of Representatives that would place an obligation on electric utilities to use more renewables and less coal. He is endeavouring to run his own international negotiations in competition with the United Nations' long-running Kyoto process. On this kind of running, it would be surprising if the APEC summit offered any hope of the world kicking the coal habit.

Would different leaders in the Big Six make any difference? In Australia, Labour is ahead in the polls, but strong on defence of coal interests. In America, the Democratic challenger Barack Obama, from the coal State of Ohio, has co-sponsored a bill to boost technology that makes gasoline from coal via a process that would be ruinous for the climate.

Meanwhile, those not in the coal big league and best placed to lead the way to a different energy future are not doing so. In the U.K., coal use is rising, renewables investment is derisory, and even investment in carbon capture and storage would pave but a short stretch of motorway. — **©Guardian Newspapers Limited, 2007**

(*Jeremy Leggett is author of* Half Gone: Oil, Gas, Hot Air and the Global Energy Crisis.)

TIMES OF INDIA 4.9.07

A 10 per cent solution

Ethanol can help India secure its energy future

With international crude oil prices ruling at over $70 a barrel, the recommendation by a group of ministers that 10 per cent ethanol blending be made mandatory across the country couldn't have come at a more appropriate time. Such a step would help the country reduce its dependence on oil imports and move towards greater use of renewable resources. There's also an environmental benefit: ethanol reduces the emission of greenhouse gases. India is one of the top 10 oil-consuming countries in the world. The domestic production of crude oil is only 32 million tonnes as against the demand for more than 110 million tonnes. Naturally, oil imports have a major bearing on India's trade deficit. The expenditure on crude oil purchase is nearly Rs 1,600 billion and is only increasing every year. Ethanol blending would help not only in alleviating the pressure on the national exchequer, but also in lessening our dependence on politically unstable countries in West Asia and Africa. By blending 10 per cent ethanol, India stands to save 80 million litres of petrol annually.

With the global sugar industry grappling with the crisis of surplus production, and the rising output of Indian sugar contributing further to holding the prices at record low levels, the Indian government can easily use this opportunity to induce sugar producers to divert molasses for the production of ethanol. The government should provide incentives like tax breaks for ethanol producers. It could set aside a portion of the massive oil budget for encouraging production of such renewable energy sources. By providing such inducements, those in the business could be persuaded to divert molasses to ethanol production rather than selling to breweries and distilleries.

However, sugar being a cyclical industry, it is bound to see ups and downturns. To ensure the availability of ethanol during downturns in the industry, the government must encourage research in various feedstocks for ethanol production. Ethanol can be made either from fermentation of sugar or from starches like in the United States. One of the drawbacks of sugarcane, from which ethanol is made in India, is that it is water intensive. Hence, alternative feedstock like sweet sorghum should be promoted for ethanol production.

Simultaneously, the development of flexible-fuel vehicles must be put on fast track. If Brazil can have vehicles running on E85 and even on 100 per cent ethanol, there is no reason why India cannot replicate the same. E10, nevertheless, is certainly an inspiring beginning.

INDIAN EXPRESS 4.9.07

India in the hot seat

On global warming, India shouldn't just bargain hard at international fora. It should start acting unilaterally



LAVEESH BHANDARI

AMONG the many challenges facing India there is one that has had little policy related discussion. This is the impact of global warming. Some facts. Global warming is here, and there is a very high likelihood that this warming is due to human efforts towards improving their economic well-being. As per the IPCC there is a 90 per cent likelihood that a rise in 'greenhouse gases' that include carbon dioxide, carbon monoxide, methane brought about the rise in global temperatures. And the recent UN Climate Change Talks held in Vienna have only highlighted that India its own viable, unilateral strategy rather than simply looking for better bargaining solutions in international negotiations.

All indications are that even if there was no increase in greenhouse emissions, India will be a much warmer country. The full impact of past emissions will play out in the next few years. Himalayan glaciers would be much smaller, river water levels would show larger variations, floods and droughts will both be more frequent, low lying land will disappear within the sea, and many other effects will be upon us. This is not a doomsday opinion piece — this is going to happen.

Of course, if increases in greenhouse emissions continue at the current rate, these impacts will be much higher in scope and severity. As India and China continue to grow, their greenhouse gas emissions will accelerate. Rapidly expanding economies will impact the environment rapidly. And this impact will not be positive.

There are three aspects to environment policy. The first is how to deal with the warmer environment. The second, how to reduce potential environment damage. And the third, the need for unilateral action.

Of all the solutions available, some which will not require economic growth and some which will, each technological possibility will need to be backed by appropriate economic policy. And because many economic policies are under the state governments, we merely need a consensus on an appropriate direction that India should move towards.

If policy reform of the past is any indication, it takes about a decade for a national consensus to emerge and be translated into specific policy measures. The earlier we start with this process, the lower the costs that would need to be borne. And it is

Contd. on pg 16

India in the hot seat...

quite apparent that the changing environment will affect the underprivileged the most adversely.

So what do we need to do? And that is the strange part — we have little clue! Perhaps reducing glacier size requires us to store water in the upper part of the Himalayas. Perhaps changing weather patterns requires a hardier set of hybrid seeds. Or perhaps we need a different approach to agriculture altogether. One that is less dependent upon energy intensive inputs such as fertilisers. Perhaps rising sea levels will require us to build Holland type dykes and dams that will allow farmers to farm on land lower than sea level. Or perhaps we will just need to ensure that farmers in delta systems are re-settled. In that case we should know that we will not be able to get them agricultural land so they will need to shift occupations.

The infrastructure and agriculture sectors will be most sensitive to changed climatic patterns. Temperatures a few degrees higher or rains that shift by a couple of weeks could change the optimal crop to grow or seed to use. It could change the timing of steps in the crop production process. It could change animal husbandry practices. And it could change fishing practices as well.

Infrastructure is another important sector. Perhaps, roads in some parts will need to be made more robust to high precipitation, or perhaps irrigation requirements would be different. Urban infrastructure, it is quite apparent already, will need to be supplemented with better rainwater drainage. Rainwater storage systems, embankments, ponds and dams will perhaps become even more essential. An Indo-Nepal joint effort could become an even more important component of a common flood control system. The list is long, not infinite.

These are the first steps in the India warming story. The more serious problems of arresting the greenhouse effect will need to eventually become the centrepiece of the environmental-economy policy. There is much that needs to be done. We should start on this unilaterally rather than wait for the western countries to show the way. Let's get talking.

The writer heads Indicus Analytics
laveesh@indicus.net

HINDU 1.4.07

Climate change could trigger global food crisis

Experts issue warning at U.N.-backed forum on sustainable development.

Ian Sample

Climate change and an increasing population could trigger a global food crisis in the next half century as countries struggle for fertile land to grow crops and rear animals, scientists warned on Thursday. To keep up with the growth in human population, more food will have to be produced worldwide over the next 50 years than has been during the past 10,000 years combined, the experts said.

But in many countries a combination of poor farming practices and deforestation will be exacerbated by climate change to steadily degrade soil fertility, leaving vast areas unsuitable for crops or grazing. Competition over sparse resources may lead to conflicts and environmental destruction, the scientists fear.

The warnings came as researchers from around the world convened at a United Nations-backed forum in Iceland on sustainable development to address the organisation's millennium development goals to halve hunger and extreme poverty by 2015.

The researchers will use the meeting to call on countries to impose strict farming guidelines to ensure that soils are not degraded so badly they cannot recover.

"Policy changes that result in improved conservation of soil and vegetation and restoration of degraded land are fundamental to humanity's future livelihood," said Zafar Adeel, director of the international network on water, environment, and health at U.N. University and co-organiser of the meeting.

"This is an urgent task as the quality of land for food production, as well as water storage, is fundamental to future peace. Securing food and reducing poverty ... can have a strong impact on efforts to curb the flow of people, environmental refugees, inside countries as well as across national borders," he added.

The U.N. millennium ecosystem assessment ranked land degradation among the world's greatest environmental challenges, claiming it risked destabilising societies, endangering food security and increasing poverty.

Some 40 per cent of the world's agricultural land is seriously degraded. Among the worst affected regions are Central America, where 75 per cent of the land is infertile, Africa, where a fifth of the soil is degraded, and Asia, where 11 per cent of the land is unsuitable for farming.

Soil erosion

The majority of soil erosion is caused by water, either through flooding or poor irrigation, with the rest lost to winds. Farming practices such as ploughing also damage soil, as does repeated planting in fields, which depletes the soil of nutrients.

"You can sum it up as need, greed and ignorance," said Andrew Campbell, an Australian environmental consultant. "Some pressures on soil resources come from simple human needs, where people don't have any option but to grow crops or farm animals. But in other instances world markets demand produce, so

Contd. on pg 17

Dryland farmers and climate change

A combined effort to deal with climate uncertainty, land degradation, and water scarcity is needed.

William D. Dar

This year, the global community was alarmed by the prospects of global warming and climate change when the former United States Vice President Al Gore's movie, *The Inconvenient Truth*, won the Academy Award. The movie sparked debates, but more importantly, brought global attention to the issue of climate change.

At the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), we believe climate change will make dryland agriculture even more risk-prone especially in the developing world. Thus, for farmers struggling under the burden of cultivating land under the ever-present threat of drought, floods, mid-season dry spells, land degradation, and water scarcity, such problems associated with climate change will have to be answered more frequently.

Unless the livelihoods and resource base of such vulnerable rural communities can be made more resilient, coping with climate change may be next to impossible for poor dryland farming communities. Working over decades with poor farmers in the drylands of Asia and sub-Saharan Africa, ICRISAT's research shows that a combined effort to deal with current climate uncertainty, land degradation, and water scarcity is the only way by which the resilience of these communities can be brought about.

With improved tools becoming available in studying climate uncertainty, it has now become possible for decision-makers and investors to formulate a development agenda integrating short, medium, and long-term timeframes. Short-term seasonal forecasting enables farmers and other stakeholders to plan more effectively and fine-tune their strategies for the coming season. Medium-term understanding enables them to predict the impact and profitability of improved agricultural practices. Long-term understanding helps them predict the likely impact of climate change on rain-fed farming systems, and their future development and productivity.

This integrated climate risk assessment and management framework is fundamental to ICRISAT's collaborative research on managing climatic uncertainty and adapting to climate change. This will enable investors (governments, donors, researchers or farmers) to understand better the risks and opportunities and get greater returns from more diversified and targeted investments.

Overcoming land degradation

Land degradation, which is a persistent problem in the drylands of Asia and sub-Saharan Africa, can be further worsened by climate change. ICRISAT has been working with partners for years on combating land degradation in Asia and sub-Saharan Africa. The following are some of ICRISAT's effective interventions:

Desert Margins Programme: Working with five other Centres of the Consultative Group on International Agricultural Research (CGIAR) and other partners, it is a collaborative initiative among nine African countries — Botswana, Burkina Faso, Kenya, Mali, Namibia, Niger, Senegal, South Africa, and Zimbabwe. This programme is guided by the principle that desertification in areas bordering deserts can be avoided and reversed by enhancing the resilience and biodiversity of the agro-ecosystem; and improving farmers' livelihoods through more productive, profitable, and stable land management.

Fertilizer microdosing: Research has shown that poor soil fertility is a major food production constraint across much of the West African Sahel. When plants are malnourished, their roots cannot collect enough rainwater. Microdosing is the practice of providing the growing crop with the appropriate quantity of fertilizer at the right time. Microdosing is a technique that enables farmers to measure the right amount of fertilizers in the caps of soft drink or beer bottles and placing these along with the seed. This innovative technique has reintroduced fertilizer use in Zimbabwe, Mozambique, South Africa, Niger, Mali, and Burkina Faso.

Drylands Eco-Farm: An innovative trees-crops-livestock system for rain-fed crop production, it involves intercropping fast-growing trees with annual crops. Also included in the system are livestock that are appropriate for the agro-ecosystem. Profits from the eco-farms are three to five times higher than the current farming systems.

Increasing water scarcity

In agricultural research, water is often considered in two distinct categories. "Green water" represents the moisture contained in the soil profile from rain or irrigation, whereas "blue water" accounts for the run-off from rain or irrigation and contained in water bodies such as dams, rivers, lake, and aquifers. Climate change is expected to make some regions of the globe even drier — that is, make water even scarcer.

Lack of water is also the cause of major food crisis, like the one experienced in Niger because of drought in 2005. This type of crisis is a "green water" crisis, and is usually an extreme consequence of an erratic rainfall pattern in the semi-arid tropics. It is rendered more acute with current climate change trends, where soil moisture limits yield and eventually reduces food supply. Green water scarcity can be compensated by blue water if irrigation facilities and water are available. Unfortunately, given the limited volume of blue water available, the scope for increasing the area already under irrigation is limited. Agriculture in these areas will likely remain rain-fed.

At ICRISAT, we work to promote rain-fed agriculture in the drylands, and generate innovations that ensure food security and income generation, adapted to the limited green water availability, and capable of coping with extreme climatic conditions. Our research, which

Contd. on pg 19

People's rule

Karnataka has carried forward the tradition of local governance prevalent in the princely state of Mysore. BY RAVI SHARMA

The gram panchayats execute schemes for rural development. The **gram panchayats have evolved over** the last decade to take on more strategic responsibilities for the development of the community.

KARNATAKA has a long history of decentralisation of governance and planning. In the erstwhile princely state of Mysore, the idea of local self-governance emerged as early as in 1874 with the establishment of "local fund committees". Though they were not too popular, thanks to the dominance of the official members, they set the tone for grassroots administration. There are 27 zilla panchayats, 175 taluk panchayats and 5,652 gram panchayats in Karnataka.

A number of laws passed in the princely state, and later in the modern State, sought to loosen the hold of the bureaucracy and make governance more representative. The Mysore Local Boards Act of 1902 provided a three-tier local self-government structure consisting of the village panchayat with a nominated chairman, a taluk board with the subdivision officer as president, and a district board with the deputy commissioner as president. Then there was the Mysore Local Boards and Village Panchayat Act, 1918, and the Mysore District and Mysore Village Panchayats Act, 1926.

The Mysore Village Panchayats and Local Boards Act, 1959, was enacted within the broad framework of the Balwanthrai Mehta Committee Report. The Panchayat Raj Institutions Act, 1959, and the Karnataka Zilla Parishads, Taluk Panchayat Samithis, Mandal Panchayats and Nyaya Panchayats Act, 1983, also sought to make local governance more representative.

The 1983 Act established a new Panchayati Raj system that consisted of mandal or gram panchayats at the village level and taluk panchayat samitis and zilla (district) parishads. The Act also provided for gram sabhas, or village assemblies, which comprised all eligible voters of a given mandal panchayat, panchayat members and government officers. The sabha members would use the forum to discuss and review development problems and programmes of the village, select beneficiaries for welfare-oriented programmes and plan for the development of the village's economy and its people.

Karnataka has 56,682 rural habitations, including 27,017 revenue villages. Most people living in these rural habitations depend on agriculture. It is the responsibility of the Rural Development and Panchayat Raj Department (RDPRD) to implement the provisions of the Karnataka Panchayat Raj Act, 1993. The Department is implementing a number of schemes to improve the living conditions of the people.

Services such as the provision of drinking water, sanitation, roads and street lights are outlined in the Karnataka Panchayat Raj Act, 1993. The gram panchayats execute the schemes formulated by the State and Central governments for rural development. Thus, the gram panchayats have evolved over the last decade to take on more strategic responsibilities for the development of the community.

Highlighting some of the programmes being implemented by the RDPRD, its secretary, G.V. Kongawad, said that under the Suvarna Gramodyogal, launched in 2006, 195 backward villages had been identified for construction of houses for schools and anganwadis. Young people would be trained in vocations other than agriculture, roads and drains would be built, and drinking water would be provided. "One thousand villages will be selected every year and the Karnataka government will spend Rs.1,000 crore on this programme annually," he said.

Karnataka's total rural road length is 47 lakh km. Some rural roads are improved and maintained with grants from the Centre under the Prime Minister's Pradhan Manthri Gram Sadak Yojana. In an attempt to improve transparency in the road maintenance work, the Karnataka government has decided to employ a package system, involving a tender process.

20

The other half

KARNATAKA has been in the forefront in promoting gender equality, empowering women in economic, socio-cultural and political spheres. As a patriarchal society moves towards gender equality, women need more access to resources, greater political voice and social transformation that allows them to take decisions that affect their own lives as well as society in general. The Karnataka Human Development Report, 2005, says: "The stagnation in women's work participation in the poorer districts, the narrowing of their work and income opportunities, growing wage differentials between men and women and the huge and apparently increasing disparities among the higher and lower income regions of the State, when combined with rising aspirations as reflected in women's growing educational involvement, pose a major challenge to the policies of the government".

In the last decade, the State has undertaken, through agencies such as the Women and Child Development Department (WCDD), major initiatives such as allotment of house title deeds to women under government-sponsored, low-income housing programmes. The government has also implemented 30 per cent job reservation for women in all direct recruitments to government and public sector units.

Under the WCDD's Stree Shakti scheme, which was launched in 2000-01, 1.20 lakh self-help groups based on thrift-and-credit principles were formed at the village level through a network of 40,300 Anganwadi workers. There are 17.80 lakh women employed under the scheme; their combined savings amount to Rs.444.91 crore and the total amount provided by banks for the scheme is Rs.496.13 crore.

The State government recently re-launched an insurance scheme, Bhagyalakshmi, for girl children from families living below the poverty line (BPL). Implemented in tandem with the Life Insurance Corporation of India, the scheme will provide financial support for the education, health care and marriage of girl children born after March 31, 2006. Dr. Shalini Rajneesh, Secretary, WCDD, said the scheme would be limited to two girl children of a BPL family. To avail herself of the benefit, a girl child must have her birth certificate with her name on it, and should attend an Anganwadi centre until the age of six and study up to Standard VIII. To receive the insured amount when she is an adult, the girl should not get married before she turns 18.

Under the scheme, the WCDD deposits Rs.10,850 in the name of the girl child. The government has set aside Rs.166 crore for 1.5 lakh children for the financial year 2006-07. This year, Rs.225 crore has been earmarked for the scheme. Each child covered under the scheme gets health insurance up to a maximum of Rs.25,000 a year and annual scholarships between Rs.300 and Rs.1,000 as she progresses academically. The earning parent's life is insured for Rs.1 lakh in case of death by accident and Rs.42,500 in case of natural death. At the end of 18 years, the first beneficiary from a family will be paid Rs.34,751 while the second beneficiary will get Rs.40,918. Dr. Rajneesh said 80,000 bonds had already been issued. The scheme was launched once before in 1996-97, but got mired in administrative problems.

To stop trafficking in women and children, the department has an action plan that envisages wider and specific responsibilities for various government departments. They are required to maintain records of the number of women and children, with details of school-going children; and also whether any of them are missing and, if so, what action has been taken.

Ravi Sharma

The Karnataka Rural Employment Guarantee Scheme seeks "to provide livelihood and security to households in the rural areas by providing not less than one hundred days of guaranteed employment in every financial year"; the promotion of rural sanitation through the State's Nirmala Grama Yojana and the Central Rural Sanitation Programme; and the novel habitat development programme Swachcha Grama Scheme, which has been launched at a cost of Rs.200 crore for implementation in 1,000 villages in batches of 250 with assistance from Housing Urban Development Corporation (HUDCO).

The Department, which is responsible for coordinating the provision of water supply for domestic purposes in over 56,682 rural habitations, is implementing rural water supply schemes, the centrally sponsored Accelerated Rural Water Supply Programme, sub-mission projects for rural habitations with water quality problems under the Rajiv Gandhi National Drinking Water Mission, and also schemes aided by the World Bank and the Danish International Development Agency.

Under the Swarna Jayanthi Gram Swarozgar Yojana, the Department assists rural households below the poverty line through credit, subsidy and training facilities. □

21

Water Governance Workshop

Water
A Life Support System
Issues Related to Water in Andhra Pradesh

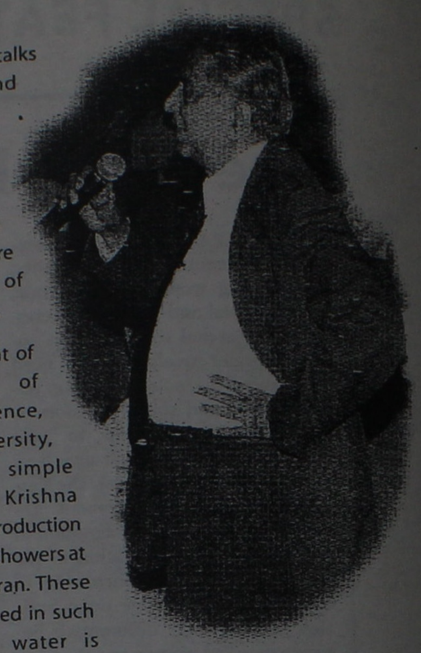
R. Rajamani*

Some of the important points raised by R. Rajamani during his address highlight that governance does not include water. Water is a life support system and is above everything.

The work done on comprehensive water resource development in Chinnajalapuram village by the community, Rural Integrated Development Society (RIDS) and SPWD is appreciable. There have been good models related to water resource management in Andhra Pradesh(AP), which can be built upon. There is a need to address these issues and also infuse more science into these programmes. According to a Mekong basin document, "Engineering approach should be adopted in a balanced manner considering the prevalent socio-economic, cultural and ecological aspect of any potential water resource development project". Modern engineering approaches have long been applied to harness and develop water resources without looking at these issues. An article in the Science magazine says that, "Modern technology cannot somehow solve India's water problems and provide enough water for its limitless growth. Rather what is needed is a kind of adaptive living within the constraints imposed by natural resource system, which requires a thought on water responsibility. This is a formidable task achieved only through the rational coming together of science and society facilitating which is a challenge for the Science Academy which has to see that scientific knowledge is propagated". Sivaramakrishna's Godavari primer says, "We need to plan from the needs of the end users in the basin rather than on the basis of so-called surplus water". Basin also means inter-state and not only within a state. Intra-state problems have also surfaced now. We have to look at the state of rivers in AP. According to a Chinese Taoist of sixth century BC, "Rivers were like the mouths of the infants, if one tries to stop them they only get louder".

While the Bills on coastal water, flood plain management have been drafted and circulated not much has been accomplished in those areas.

Environment Policy talks of conservation and management of river basins involving all relevant stakeholders, in particular local communities to ensure maintenance of hydrological aspects.



R. Rajamani

A study by a student of Department of Environment Science, Andhra University, recommends a simple solution to lessen Krishna river pollution by introduction of small changes in showers at places like Pushkaran. These showers are designed in such a way that the water is re-filtered before it is let back into the river.

According to a study by KCB Raju of Vivekananda Research and Training Institute (VRTI), Kutch, it is possible to recharge ground water if we adopt correct practices. Why is recharge not a part of the package that the law has envisaged?

Small is beautiful especially in the context of the damage done by big dams. Environment Impact assessment (EIA) has become big business in AP as elsewhere. EIA is being used for the wrong reasons as is evident from the case of projects like Polavaram.

There is need to come up with alternatives to bigger projects as by Hanumantha Rao in the case of Polavaram to minimize suffering and maximize output and welfare. Small Water Harvesting Structures are cost effective unlike the proposed project of Central Water Commission on inter-linking especially when one takes issues like equity, labour intensiveness and income intensity of the community into account.

Accountability and integration are being taken care of now especially after the Right to Information Act. However information like feasibility reports of bigger structures under inter-linking of rivers should be published and made available at the village level in regional languages.

Priority must be given to restoration of traditional systems and diverse cropping and there is a need for a policy decision on the same.

Linkage between irrigation and poverty have not been adequately addressed so far. Rainfed areas have not been adequately looked at and in their name, many projects have been undertaken.

The traditional practice of growing of *babul* trees on the foreshore to reduce evaporation is indicative of the water responsibility of the people.

There is a need to base the water management systems on people's needs and not their greed. The case of Plachimada, Kerala where the people have recognised that their need is greater than Coca-Cola's/ urban population's greed, is remarkable. Our approach to such issues should also figure in the discussion on Water Governance in Andhra Pradesh. ■

* *Member, Governing Board, SPWD*
Former Secretary, Ministry of Environment and Forests.
Address in workshop on Water Governance in Andhra Pradesh, April 2007

Five Myths of the Agrofuels Transition

Biofuel Baggage

Eric Holt-Gimenez*

Biofuels. The term invokes a life-giving image of renewability of abundance-a clean, green sustainable assurance in technology and the power of progress. This image allows industry, politicians, the World Bank, The United Nations, and even the Intergovernmental Panel on Climate Change to present fuels made from corn, sugarcane, soy and other crops as the next step in a smooth transition from peak oil to a yet-to-be-defined renewable fuel economy. Drawing its power from a cluster of simple cornucopian myths, "biofuels" direct our attention away from the powerful economic interests that benefit from this transition. It avoids discussion of the growing North-South food and energy imbalance. More fundamentally, it obscures the political-economic relationships between land, people, resources and food. By showing us only one side, "biofuels" fail to help us understand the profound consequences of the industrial transformation of our food and fuel systems-The Agrofuels Transition.

The Agrofuel Boom

Industralised countries unleashed an "agrofuels boom" by mandating ambitious renewable fuel targets. Renewable fuels are scheduled to provide 5.75 percent of Europe's transport fuel by 2010, and 10 percent by 2020. The United States aims at 35 billion gallons a year. These targets far exceed the agricultural capacities of the industrial North. Europe would need to plant 70 percent of its farmland to fuel. The U.S.'s entire corn and soy harvest would need to be processed as ethanol and biodiesel. Converting the bulk of their arable land to fuel crops would wreak havoc with the North's food systems. Therefore Organisation for Economic Corporation and Development (OECD) countries are looking to the Global South to meet their fuel demands. Southern governments appear eager to oblige. Indonesia and Malaysia are rapidly expanding oil-palm plantations in an effort to supply upto 20 percent of the EU biodiesel market. In Brazil where fuel crop acreage already occupies a land area the size of Netherlands, Belgium, Luxembourg and Great Britain combined-the government is planning a five-fold increase in sugar cane acreage. Their goals is to replace 10 percent of the world's gasoline by 2025. The rapid capitalization and concentration of power within the agrofuels industry is breathtaking. Over the last three years venture capital investment in agrofuels has increased eightfold. Private investment is swamping public research institutions. Behind the scenes-and under the noses of most national anti-trust laws-giant oil, grain, auto and genetic engineering corporations are forming powerful partnerships: ADM and Monsanto, Chevron and volkswagen; BP, Dupont, and Toyota. These corporations are consolidating the research, production, processing, and distribution chains of our food and fuel systems under one colossal, industrial roof.

Agrofuel champions assure us that because fuel crops are renewable, they are environmentally-friendly, can reduce global warming, and will foster rural development. But the tremendous market power of agrofuel corporations, coupled with the poor political will on the part of governments to regulate their activities, leads us to doubt these happy scenarios. Before jumping on the bandwagon, the mythic baggage of the agrofuels transition needs to be publicly unpacked.

"If even five percent of biofuels are sourced from wiping out existing ancient forests, you've lost all your carbon gain."

Myth One

Agrofuels are Clean and Green

Because photosynthesis from fuel crops removes green house gases from atmosphere and can reduce fossil fuel consumption, we are told fuel crops are green. But when the full "life cycle" of agrofuels is considered-from land clearing to automotive consumption-the moderate emission savings are undone by far greater emissions from deforestation, burning, peat drainage, cultivation, and soil carbon losses. Every ton of palm oil produced results in 33 tons of carbon dioxide emissions-10 times more than petroleum. Tropical forests cleared for sugarcane ethanol emit 50 percent more greenhouse gasses than the production and use of the same amount of gasoline. Commenting on the global carbon balance, Doug Parr, Chief UK Scientist at Greenpeace states flatly. "If even five percent of biofuels are sourced from wiping out existing ancient forests, you've lost all your carbon gain."

There are other environmental problems as well. Industrial agrofuels require large applications of petroleum-based fertilisers, whose global use-now at 45 million tons/year-has more than doubled the biologically available nitrogen in the world, contributing heavily to the emission of nitrous oxide, a greenhouse gas 300 times more potent than CO_2. In the tropics-where most of the world's agrofuels will soon be grown-chemical fertiliser has 10-100 times the impact on global warming compared to temperate soil applications. To produce a litre of ethanol takes three to five litres of irrigation water and produces up to 13 litres of waste water. It takes the energy equivalent of 113 litres of natural gas to treat this waste, increasing the likelihood that it will simply be released into the environment to pollute streams, rivers and groundwater. Intensive cultivation of fuel crops also leads to high rates of erosion, particularly in soy production-from 6.5 tons/hectare in the US to upto 12 tons/hectare in Brazil and Argentina.

Instead of converting land to fuel production, what urgently needed are massive transfers of food-producing resources to the rural poor.

Myth Two

Agrofuels will not Result in Deforestation

Proponents of agrofuels argue that fuel crops planted on ecologically degraded lands will improve rather than destroy the environment. Perhaps the government of Brazil had this in mind when it reclassified some 200 million hectares of dry tropical forests, grassland, and marshes as "degraded" and apt for cultivation. In reality, these are the biodiverse ecosystems of the *Mata Atlantica*, the *Cerrado* and the *Pantanal*, occupied by indigenous people, subsistence farmers, and extensive cattle ranches. The introduction of agrofuel plantations will simply push these communities to the "agricultural frontier" of the Amazon where the devastating patterns of deforestation are all too well-known. Soybeans supply 40

* *Dr. Geinenez is Executive Director, Food First/Institute for Food and Development Policy.*
Global Research © 2005
Emailed by Viren Lobo, Programme Director, Western Region, SPWD, Udaipur, Rajasthan

24

Evolution of Indian Biofuels

1975 : India begins examining the feasibility of blending ethanol with petrol. Sets up six technical committees and four study groups.

1980 : The Indian Oil Corporation conducts trials on 15 passenger cars, 21 two & three wheelers using 10 percent and 20 percent anhydrous ethanol blends.

2000 : The Ministry of Petroleum and Natural Gas initiates pilot projects in three Depots (two Maharashtra and one in Uttar Pradesh) covering 350 petrol stations to study related aspects of blending ethanol with petrol and its use.



2002 : The government mandates blending of five percent ethanol in nine states and four union territories with a Rs 0.75 excise duty exemption. A Committee on Development of Biofuels is constituted.

2003 : The Committee recommends strengthening the ongoing programme of blending of ethanol with petrol and launching a National Mission on Biodiesel based on jatropha plantation. Meanwhile the National Auto Fuel Policy recommends commercialisation of biofuel vehicles.

2004 : Problems related to feedstock supply of molasses force the Indian government to suspend mandatory blending of ethanol in petrol.

2005 : The resurgence in sugar and molasses production results in renewed interest in ethanol programme. The government fixes purchase price of ethanol by oil companies at Rs. 28.25 per litre.

2005 : The government announces a Biodiesel Purchase Policy, fixing the purchase price for oil companies at Rs. 25 per litre. Initially, five percent biodiesel is blended with diesel, with plans to extend the blending to 20 percent.

2007 : The National Biofuels Draft Policy envisages utilisation of a wide range of locally available biocrops for production, setting up of a National Biofuels Development Board and revising the indicative target for five percent and 10 percent biodiesel blending in diesel by 2012 and 2017 respectively. A Biofuels Mission focusing specifically on pongamia and jatropha is also launched.

The Hindustan Times

25

percent of Brazil's biodiesel. NASA has positively correlated their market price with the destruction of the Amazon rainforest-currently at nearly 325,000 hectare a year. Called "The Diesel of Deforestation," palm oil plantations for biodiesel are the primary cause of forest loss in Indonesia, a country with one of the highest deforestation rates in the world. By 2020, Indonesia's soil-palm plantations will triple in size to 16.5 million hectares-an area the size of England and Wales combined-resulting in a loss of 98 percent of forest cover. Neighboring Malaysia, the world's largest producer of palm oil, has already lost 87 percent of its tropical forests and continues deforesting at a rate of seven percent a year.

Myth Three

Agrofuels will Bring Rural Development

In the tropics, 100 hectares dedicated to family farming generates 35 jobs. Oil palm and sugar cane provide 10 jobs, eucalyptus two, and soyneans a scant half-job per 100 hectares, all poorly paid. Until recently, agrofuels supplied primarily local and sub-regional markets. Even in the U.S. most ethanol plants were relatively small, and farmer-owned. With the agrofuels boom big industry is quickly moving in, centralising operations and creating gargantuan economies of scale. Big Oil, Big Grain and Big Genetic engineering are rapidly consolidating control over the entire agrofuel value chain. The market power of these corporations is staggering: Cargil and ADM control 65 percent of the global grain trade, Monsanto and Syngenta a quarter of the $60 billion gene-tech industry.This market power allows these companies to extract profits from the most lucrative and low-risk segments of the value chain, e.g. inputs, processing and distribution. Agrofuels producers will be increasingly dependent on a tightly-organised cabal of companies for their seed, inputs, services, processing and sale. They are not likely to receive many benefits. More likely, smallholders will be forced out of the market and off the land. Hundreds of thousands have already been displaced by the soybean plantations in the "Republic of Soy" a 50+ million hectare area covering southern Brazil, northern Argentina, Paraguay, and eastern Bolivia.

Myth Four

Agrofuels will not Cause Hunger

Hunger, said Amartya Sen, results not from scarcity, but poverty. According to the Food and Agriculture Organisation (FAO), there is enough food in the world to supply everyone with a daily 3,200-calorie diet of fresh fruit, nuts vegetables, dairy and meat.

Nonetheless, because they are poor, 824 million people continue to go hungry. In 2000, world leaders promised to halve the proportion of hungry people living in extreme proverty by 2015. Little progress has been made. The world's poorest people already spend 50-80 percent of their total household income on food. They suffer when high fuel prices, push up food prices. Now, because food and fuel crops are competing over land and

Sustainability Comes at a Price

As a cure for our addiction to oil, ethanol turns out to have some nasty side effects. Pollution from gasoline engines accounts for 10,000 deaths in the US each year, along with thousands of cases of respiratory disease and even cancer. The widely touted ethanol-based fuel E85 (15 percent gasoline, 85 percent ethanol) could make matters worse.

Mark Jacobson of Stanford University in California modelled emissions for cars expected to be on the road in 2020. The model assumed that carbon emissions would be 60 percent less than 2002 levels, so overall deaths would be halved. However, an E85-fuelled fleet would cause 185 more pollution-related deaths per year than a petrol one across the US, most of them in Los Angeles.



The findings, to be published in *Environmental Science & Technology*, run counter to the idea that ethanol is a cleaner-burning fuel. While ethanol burning cars will emit fewer carcinogens such as benzene and butadiene, they will spew out 20 times as much aceteldehyde as those using coventional fuel. Acetaldetryde can react with sunlight to form ozone, one of the main constituents of smog, and so increase the risks to people's health.

Without the predicted 60 percent emisssions it will be worse. "If we went on today's emissions, there could be two-and-a-half times more damage," Jacobson says. "There are so many people barking pretty loud about biofuels. They've been pushing these things before the science is done. Now the question is, will people listen ?"

www.newscientist.com

26

resources, high food prices may actually push up fuel prices. Both increase the prices of land and water. This perverse, inflationary spiral puts food and productive resources out of reach for the poor. The International Food Policy Research Institutes has estimated that the price of basic food staples will increase20-33 percent by the year 2010 and 26-135 percent by the year 2020. Caloric consumption typically declines as price rises by a ratio of 1:2. With every one percent rise in the cost of food, 16 million people are made food insecure. If current trends continue, some 1.2 billion people could be chronically hungry by 2025-600 million more than previously predicted. World food aid will not likely come to the rescue because our surpluses will go to our gas tanks. Perversely, food aid only increases when food prices are low, not high. Instead of converting land to fuel production, what are urgently needed are massive transfers of food-producing resources to the rural poor.

Myth Five

Better "Second-Generation" Agrofuels are Just Around the Corner

Proponents of agrofuels like to reassure "food versus fuel" skeptics by asserting that present agrofuels made from food crops will soon be replaced with environmentally - friendly crops like fast-growing trees and switchgrass. This myth, wryly referred to as the "bait and switch-grass" sheil game, helps make first generation agrofuels socially acceptable. The agrofuel transition transforms land use on massive scales, pitting food production against fuel production for land, water and resources. The issue of which crops are converted to fuel is irrelevant. Wild plants cultivated as fuel crops won't have a smaller "environmental footprint" because commercialisation will transform their ecology. They will rapidly migrate from hedgerows and woodlots onto arable lands to be intensively cultivated like any

Limits-not incentives-must be placed on the agrofuels industry. It is unconscionable for the North to shift the burden of over-consumption to the Global South simply because the tropics have more sunlight, rain and arable land.

Green Fuel by Men in Greens

The jatropha initiative was started at the behest of Indian Army in September last and 25 hectares have already been deployed for jatropha cultivation.

The Defence Agricultural Research Laboratory (DARL) at Pithoragarh, perched high in the Kumaon hills, has just attained a major breakthrough in developing an extremely high oil yielding jatropha germplasm, for which tissue culture is now underway.

In the quest to reduce the armed forces' dependence on fossil fuels, the Defence Research & Development Organisation (DRDO) trained its sight on the slicky virtues of the shrubby jatropha plant. It has now short listed two genotypes - DARL-1 and 2 - which could well revolutionise convoy movement in the remotest of geographies, at a fraction of today's cost. And with 5,000 jatropha-ready hectares with the Ministry of Defence, biofuel is blooming where the guns were once booming.

The jatropha initiative was started at the behest of Indian Army in September last and 25 hectares have already been deployed for jatropha cultivation. The Ministry of Defence plans to extend the area under cultivation to 65 acres by the year end. And apart from the 5,000 hectares already with the Ministry for possible jatropha cultivation, there's "positive dialogue" between the Rajasthan and Gujarat state governments to bring in more acreage under cultivation.

The initiative will help Indian Army gain some self sufficiency in its fuel requirements apart from several other benefits.

The Army operates at altitudes where the temperature drops to 50 degree Celsius, or in deserts that scorch a 50 degree plus trail.

People even have to work under the sea with a lot of pressure above them, or in the eastern part of India where there are blood-sucking insects. Strategic points call for the promotion of biofuels.

27

other industrial crop-with all the associated environmental externalities.

By genetically engineering plants with less lignin and cellulose, the industry aims to produce cellulose agrofuel crops that break down easily to liberate sugars, especially fast growing trees. Trees are perennial and spread pollen further than food crops. Cellulosic candidates miscanthus, switch grass and canary grass, are invasive species. Given the demonstrated promiscuity of genetically-engineered crops, we can expect massive genetic contamination. Monsanto and Syngenta will be quite pleased. Agrofuels will serve as their genetic Trojan horse, allowing them to fully colonize both our fuel and food systems.

Any technology with potential to avoid the worst impacts of global warming must be commercially viable on a global scale within the next five to eight years. This is highly unlikely with cellulosic ethanol, a product that has thus far demonstrated no carbon savings. Making it a green, viable product is not simply matter of scaling up existing technology, but of major breakthroughs in plant physiology that permit the economically efficient breakdown of cellulose, hemi-cellulose, and lignin. The agro fuel industry is either betting on miracles or counting on taxpayer bail-outs. Faith in science is not science. Selective faith in second-generation fuel-rather than working to improve existing solar, wind, or conservation technologies-is bias in favour of the highest bidder.



The question is not whether ethanol and biodiesel per-se have a place in our future, but whether or not we allow a handful of global corporations to determine our future by dragging us down the dead end of the agrofuels transition.

The Twin is Dead Long Live the Twin

The International Energy Agency estimates that over the next 23 years, the world could produce as much as 147 million tons of agrofuel. This will be accompanied by a lot of carbon, nitrous oxide, erosion, and over two billion tons of waste water. Remarkably, this fuel will barely offset the yearly increase in global oil demand, now standing at 136 million tons a year - never mind offsetting any of the existing demand. Is this worth it? The agrofuel transition closes a 200year chapter in the relation between agriculture and industry that began with the Industrial Revolution. Then, the invention of the steam engine promised an end to drudgery. However, industry's take-off lagged until governments privatized common lands, driving the poorest peasants out of agriculture and into urban factories. Peasant agriculture effectively subsidized industry with both cheap food and cheap labour. Over the next 100 years, as industry grew, so did the urban percentage of the world's population, from three percent to 13 percent Cheap oil and petroleum-based fertilisers opened up agriculture itself to industrial capital. Mechanization intensified production, keeping food prices low and industry booming. The next hundred years saw a three-fold global shift to urban living. Today, the world has as many people living in cities as in the countryside. The massive transfer of wealth from agriculture to industry, the industrialisation of agriculture, and the rural-urban shift are all part of the "Agrarian Transition," the lesser-known twin of the Industrial Revolution. The Agrarian/Industrial twins transformed most of the world's fuel and food systems and established non renewable petroleum as the foundation of today's multi - trillion dollar agrifoods complex.

The pillars of the agri-foods industry are the great grain corporations. They are surrounded by an equally formidable phalanx of food processors, distributors, and supermarket chains on one hand, and agro-chemical, seed, and machinery companies on the other. Together these industries consume four of every five food dollars. For some time, the production side of the agrifoods complex has suffered from agricultural "involution" in which increasing rates of investment (chemical inputs, genetic engineering and machinery) have not increased the rates of agricultural productivity- the agrifoods complex is paying more reaping less.

Agrofuels are the perfect answer to involution because they're subsidised, grow as oil shrinks and facilitate the concentration of market power in the hands of the most powerful players in the food and fuel industries.

Agrofuels are the perfect answer to involution because they're subsidised, grow as oil shrinks and facilitate the concentration of market power in the hands of the most powerful players in the food and fuel industries. Like the original Agrarian Transition, the present Agrofuels Transition will "enclose the commons" by industrialising the remaining forests and prairies of the world. It will drive the planet's remaining smallholders, family farmers, and indigenous people to the cities. It will funnel rural resources to urban centers in the form of fuel, and will generate massive amounts of industrial wealth.

Unfortunately, the Agrofuels Transition suffers from a congenital flaw, its fraternal twin is dead. There is no new Industrial Revolution. No expanding industrial sector waits to receive displaced indigenous communities, smallholders and rural workers. There are not production breakthroughs poised to flood the world with cheap food. This time, fuel will not subsidise agriculture with cheap energy. On the contrary, fuel will compete with food for land, water and resources. Agrofuels collapse the industrial link between food and fuel. Taken to its extreme, agrofuel will be used to grow agrofuel - thermodynamically pathetic proposition. The inherent entropy of industrial agriculture was invisible as long as oil was abundant. Now, food and fuel systems must shift from a savings to a checking account. Agrofuels lead us to overdraw. "Renewable" does not mean "limitless." Even if crops can be replanted, land, water and nutrients are limiting.

Pretending otherwise serves the interests of those monopolising those resources.

Agrofuel's appeal lies with its potential to prolong the oil economy. With an estimated one trillion barrels of oil reserves left on the planet, $100-a-barrel oil is not far off. The higher the oil prices, the more ethanol costs can rise while remaining competitive. Herein lies the contradiction for second generation agrofuels- as oil becomes more expensive, first generation agrofuels become from lucrative, discouraging the development of second-generation fuels. If oil reaches $80 per barrel, ethanol producers could afford to pay over $five per bushel (~127 kg.) for corn, making it competitive with sugar cane as well. The planet's energy crisis is potentially an $80-100 trillion dollar bonanza for food

Green Initiative by Indian Oil

Flagship Indian Oil Corporation has initiated steps to begin commercial production of biodiesel.

The state-owned company has sought about 30,000 hectares of land from the Madhya Pradesh government for jatropha plantation. Jatropha seed has been identified as the main source of making biodiesel and the company is talking to other states such as Chhattisgarh and Rajasthan for land to start plantations.

IndianOil has completed field trials with the fuel. The trial with Haryana Roadways showed a 10-15 percent reduction in emission from the 40-odd buses that used biodiesel.

Trials have also been completed successfully with Tata Motors and Indian Railways which ran locos hauling high speed Shatabdi and Jan Shatabdi trains to check the biofuel's performance regarding power, consumption and pick up etc.

The biodiesel plan may, however, come unstuck due to the government's policy in procurement price. The government has set a procurement price of Rs 26.50 for each litre of biodiesel, whereas each litre made out of imported crude palm oil costs Rs 35-40.

Besides, the nature of jatropha plants allow oil extraction from seeds only after three years. That's why despite efforts by several state governments and corporates other than IndianOil, biodiesel will have to wait for sometime before it can rule our roads.

IndianOil is trying to use this time to put in place an integrated plan for the entire value chain of biodiesel - from plantation to blending and marketing. Its R&D Centre has optimised the process of synthesising oil from jatropha seeds to conform to standard fuel specifications. It has also set up a biodiesel quality lab at the centre.

sanjay.dutta@timesgroup.com

Remote Sensing Wastelands for Biofuel

In two years, farmers in Maharashtra beset with energy and economic woes could find a new solution. *Jatropha curcas*. With a dual goal of boosting the village economy and helping farmers fulfil their own energy needs, a research project funded by the Indian Space Research Organisation (ISRO) at the University of Pune's geography department in harnessing remote sensing technology to identify suitable wastelands for cultivation of the prennial biodiesel generating plant. Launched a year ago, the project will be completed within one and a half years.

The proejct aims at preparing a *taluka* wise digital map of the state detailing potential land for cultivation, along with information on the possible productivity of each land depending on its unique agro-climatic conditions, and suggestions for the location of the processing systems. If successful, the project could become a model for implementation in other states.

28

29

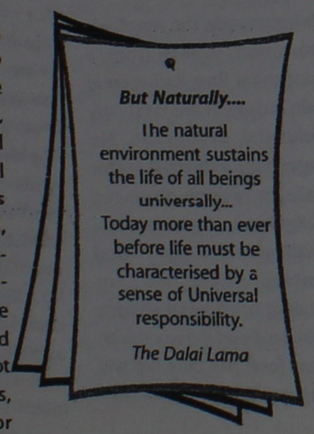
and fuel corporations. No wonder we are invited to consume our way out of over-consumption. Limits-not incentives-must be placed on the agrofuels industry. It is unconscionable for the North to shift the burden of over-consumption to the Global South simply because the tropics have more sunlight, rain and arable land. If agrofuels are to be forest and food friendly, clearly the grain, cane and oil-palm industries need to be regulated, and not in piecemeal fashion. Strong, enforceable standards based on limiting land planted to agrofuels are urgently needed, as are anti-trust laws powerful enough to prevent the corporate concentration of market power in the industry. Sustainable benefits to the countryside will only accrue if agrofuels are a complement to territorial plans for sustainable rural development, not the centerpiece.

Building Food and Fuel Sovereignty

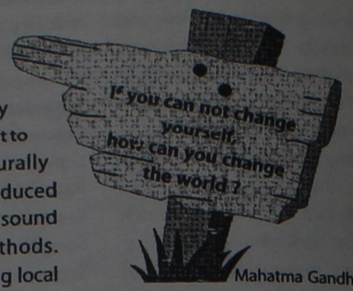
The Agrofuels Transition is not inevitable. There is no reason to sacrifice the possibility of sustainable, equitable food and fuel systems to an industrial strategy that compromises both. Many successful, locally focused, energy-efficient and people-centered alternatives are presently producing food and fuel in ways that do not threaten food systems, the environment, or livelihoods. The question is not whether ethanol and biodiesel per-se have a place in our future, but whether or not we allow a handful of global corporations to determine our future by dragging us down the dead end of the agrofuels transition. The avoid this trap we have to abandon the cornucopian myths left over from the age of abundant oil. We must dare to envision a different, steady-state agrarian transition built on redistributive land reform that repopulates and stabilises the world's struggling rural communities.

We need to rebuild and strengthen our local food systems, and ensure conditions for the local re-investment of rural wealth. Putting people and environment-instead of corporate mega-profits-at the center of rural development requires food sovereignty the right of people to determine their own food systems.

In both the Industrial North and the Global South, hundreds of thousands of producers and consumers are actively organising for their right to healthy and culturally appropriate food produced through ecologically sound and sustainable methods. They are also rebuilding local food systems architecture to ensure that most of the wealth and benefits of food systems accrue locally not in the distant corporate coffers of the agrifoods giants. They are holding agrifoods corporations accountable for the externalities that their industry imposes on taxpayers in the form of hunger, environmental destruction and poor health from cheap, processed foods.



Social movements for land reform, indigenous rights, farmer-to-farmer sustainable agriculture, ethical trade, farmer's markets, community supported agriculture, inner-city gardens and neighborbood-food systems development, are a few examples of the widespread, multi-faceted efforts for food sovereignty. Organisations like international Via Campesina Brazil's landless movement (MST), the Federation of Southern Co-operative of African-American Farmers, and the Community Food Security Coalition, are transforming the social will from these rural and urban movements into political will-the formula for social change. Food Sovereignty movements are already squaring off with



the agrofuels boom. When US President arrived in Brazil to establish an ethanol partnership with Lula, 700 women from Via Campesina greeted him by occupying Cargil's sugar mill in Sao Paulo in protest. But derailing the agrofuels juggernaut entails changing the Agrofuels Transition from an agrarian transition that favours industry to one that actually favours rural communities-a transition that does not drain wealth from the countryside, but that puts resources in the hands of rural people. This is a far-reaching project. A good next step would be to launch a pro-active, global moratorium on the expansion of agrofuels. Time and public debate is needed to assess the potential impacts of agrofuels, and to develop the regulatory structures, programmes and incentives for conservation and food and fuel development alternatives. We need the time to forge a better transition-an agrarian transition to food and fuel soveregnty. ■

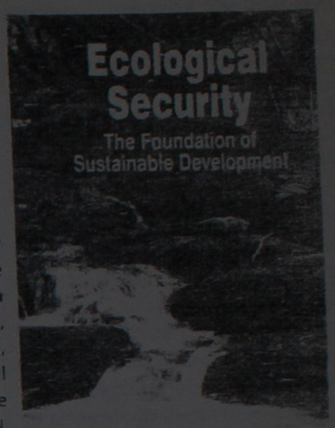
Declaimer : The views expressed in this article are the sole responsibility of the author and do not necessarily reflect those of the Centre for Research on Globalization.

30

Ecological Security

The Foundation of Sustainable Development

Edited by Samar Singh



"Ecological Security" edited by Samar Singh, formerly with Indian Administrative Service, with a preface by Bela Butalia, Editor India International Centre (IIC), India and published by Shipra Publication, Delhi 2007.

Since I have been involved in Natural Resource Management for over five decades, I was attracted by the book. I decided to read it word by word from page to page. It was a rewarding experience, which I wish to share with all concerned.

Masterpiece

The book is the product of a series of 18 lectures organised by the IIC in the year 2001 in collaboration with the Foundation for Ecological Security, Anand (Gujarat), spearheaded by Samar Singh. With his vast experienced and wide vision, Samar Singh was able to bring together eminent public figures to address the varied many faceted concerns to raise consciousness about the policy and institutional issues of the Ecological Security in India. With the opening chapter on "Ecological Security : Issues and Challenges" by Dr. Amrita Patel, followed by chapters on ecological security as related to and impacted by Faith (Karan Singh), Constitutional Dimension (L.M. Singhvi), Governance (Ashok Khosla), Policy and Planning (Shekhar Singh), Gender (Vandana Shiva), Livelihood (N.C. Saxena), Life Styles (R. Rajamani), Earth Charter (Kamla Chowdhry), Human Rights (J.S. Verma), Political Processes (Najma Heptulla), Education (Erach Bharucha), Institutional Framework (D.K. Biswas), Natural Resource Management (P.S. Ramakrishnan), Media (N. Bhaskara Rao) and Accounting for Ecological Security (R.K. Pachauri), the book provides interesting and enriching reading. Each chapter is a masterpiece and a bright jewel. To describe even in very brief will not do justice to the book. One will have to read a few chapters or preferably the whole book to appreciate the scope and dimensions of the subject and issues involved. All the 18 chapters have been complimented and supported by an excellent introduction by Samar Singh. To conclude one may say that a very enriching and rewarding contribution has been made to the policy issues of Ecological Security which is the backbone of quality and sustainable survival of the human life, flora and fauna of our earth. ■

Review by Dr. K.G. Tejwani

'The basis and *raison d'etre* of the concept of Ecological Security lies in the linking of two substantive words 'ecology and 'security', connoting an ecological condition in safe-keeping, firmly fastened and guaranteed against minimum loss of damage. Ecology is the science concerned with the relationships among and between organisms and all aspects-living as well as non living-of their environment. Security stands for that which is safe, sure and guaranteed.

This volume contains papers based on indepth studies by eminent persons on different aspects of a wide ranging, complex and contemporary subject. The book is an essential reading for all those who are concerned about securing a firm and sound foundation for sustainable development.

Earth Charter

Compassion and non violence are central themes in the Earth Charter. The Dalai Lama, reciting an ancient verse, conveys the caring and compassion needed. 'May I be a guard for those who are protectorless, a guide for those who journey on the road. For those who wish to go across the water, may I be a raft, a bridge.'

One important aspect of the Earth Charter lies in understanding that the extent of happiness and well-being, as individuals or as nations, is determined by the extent of our compassion for others. The obstacles to compassion are greed, hatred and ignorance.

The world is at the crossroads. If the Earth is to survive, and if humanity is to survive, we will have to take serious cognizance of the Earth Charter-and of the respect and compassion it stresses for the Earth and its beings.

The Earth Charter is a document that has emerged after much discussion with concerned people and communities all over the world. Different cultures, different countries, different religious, different age groups have discussed and contributed to it, and after many drafts and redrafts a final document has emerged. Like the Universal Declaration of Human Rights, it is our hope that the Earth Charter will also be endorsed by the members of the UN, so that the Charter becomes a guide for human action towards sustainable [illegible]

31

Tigers Forever

K. ULLAS KARANTH

PERHAPS no other wild animal has influenced Asia's cultures as deeply as the tiger. Efforts to save tigers by establishing special 'game preserves' go back fifty years or more, and focused modern conservation efforts over a quarter century. Although early hunter-naturalists tried to understand tigers, modern scientific studies were initiated by biologist George Schaller of the Wildlife Conservation Society only in the early 1960s,[1] in whose footsteps others followed.[2] Therefore, it is not illogical to expect, as has been the case in other applied sciences – for example, agriculture, medicine or communication – advancing scientific knowledge should have shaped efforts to save the big cat.

Surprisingly, this has rarely been the case with Indian wildlife conservation. This curious dichotomy between 'knowledge' and 'passion' or between 'reason' and 'action', has undermined efforts at tiger recovery.

1. G.B. Schaller, *The Deer and the Tiger*. University of Chicago Press, 1967.

2. K.U. Karanth, 2001, *The Way of the Tiger: the Natural History and Conservation of the Endangered Big Cat*. Orient Longman India. Hyderabad (2006 edition).

As a result, while famines, food-imports and dysfunctional telephones that characterized the 1960s have been largely conquered through application of knowledge-based solutions, tigers continue to be under grave threat.

Recent estimates suggest the tiger's historical range in Asia has shrunk by about 93%.[3] Tigers now occur only in 13 countries, down from about 30 historically. There appears to be 1.1 million square kilometres of potential tiger habitat left in the world that holds about 76 discrete tiger populations. Although there are over 20,000 tigers behind bars in captivity, global wild tiger population is precariously low, guesses of various sorts placing it at 3000-7000 individuals. Despite substantial expenditure of passion, energy and money over three decades, our efforts to save wild tigers for posterity appear to be faltering.

Considering this dismal state of affairs, some conservationists rule out any possibility that 'human interventions' (including future technological and economic advances, as well as conservation actions) might make a difference: they proclaim the tiger to be already doomed. However, such a doggedly deterministic projection of the tiger's future is a difficult proposition to accept. We live in a world of change and unpredictability, and much can be learnt from past failures and successes to change our future behaviour. Furthermore, if our model of the fate of the tiger were to include potential economic and technological changes, our predictions will be even less certain.

For example, soon after independence famine stalked India, driving massive food imports and clearing of forests for agriculture: the modern economy that could take people away from the land and increase literacy as well as drive birth rates down, crawled at the proverbial 'Hindu' rate of 3% per year. There were no conservation laws on the horizon. If any competent ecologist had built a reasonable predictive model asking whether wild tigers would survive beyond the next decade, the answer would have been a resounding no. Yet, not only did tigers survive but their populations rebounded because of the efforts of a handful of naturalists and new conservation measures, as well as, to an extent, because of improved economic growth and consequent alleviation of poverty. Viewed from this perspective, with over a million square kilometres of tiger forests still remaining in Asia, about three fourths of it in the relatively productive tropical region,[4] there are still lots of habitats left for us to recover wild tiger populations.

In spite of seemingly insurmountable and worsening conditions for tiger conservation, there are glimmers of opportunity. We have experience of successful tiger conservation actions at specific locations in India: voluntary relocation of villages from Bhadra Tiger Reserve, public education in combination with legal action that resulted in the closure of a destructive mine in Kudremukh, and a campaign that led to the termination of a failed eco-development project in Nagarahole. These instances offer clear models of how tigers and their habitats can be protected against great odds through persistent, informed advocacy.

In a broader social context, compared to the 1960s, countries like India, Thailand and Malaysia now have greater financial resources to invest in conservation. They also sport robust economies that can wean people away from hunting and land-based occupations that harm tigers. Even a poor country like Myanmar, coping with huge problems, has boldly proclaimed its intent to create the world's largest tiger reserve.

Therefore, going beyond mere doomsday prophecies, what wild tigers really need now is a clear analysis of the ecological and social challenges involved in effecting their recovery, and an honest risk-assessment backed up by bold conservation investments. In short, something akin to a venture capitalist's 'business plan'.

Wildlife Conservation Society (WCS or 'the society' henceforth) has led in ecological research and species recovery efforts since the early 1900s. It was a key player in restoring the bison to the North American prairies and in opening up exploratory faunal surveys in Burma. The global mission of the society is to 'save wildlife and wild lands through science-based conservation actions.' Its primary tactic is to build and demonstrate effective conservation solutions on the ground. Being 'science-based' necessarily involves constant self-criticism, continuous monitoring of results and merciless rejection of failed conservation models. It involves a steady shift from 'less than perfect' to 'something better', based on hard evidence. This process, sometimes called 'adaptive management', is common to the world of modern business also. However, few realize that its pioneers were, in fact, ecologists, information theorists and systems engineers.[5]

3. E. Sanderson, et al., Setting Priorities for the Conservation and Recovery of Wild Tigers: 2005-2015. The Technical Assessment. WCS, WWF, Smithsonian and NFWF-STF, New York-Washington DC, 2006.

4. Ibid.

5. B.K. Williams, J. D. Nichols and M. J. Conroy, *Analysis and Management of Animal Populations*. Academic Press, San Diego, California, 2002.

This paper describes a recent WCS initiative – ambitiously titled *Tigers Forever* – to recover wild tiger populations at several representative habitats across Asia. Tigers Forever is by no means an emotional 'seat of the pants' response: It emerged out of nearly four decades of WCS engagement with wild tigers[6] as well as with contentious conservation debates.[7] The programme's roots go deep into lessons learned from on-ground conservation interventions of its staff and local partners, particularly in India's Western Ghats and in the Russian Far East.

This empirical experience has covered an array of actions that address both long- and short-term threats to tigers. It has included monitoring tiger and prey population dynamics, enhancing local capacity for protection of tigers, prey and habitats, consolidation of tiger habitats through promotion of voluntary resettlement and land acquisitions, dealing with problem tigers, hunting and forest-product harvest issues, building local capacity for research, outreach, community education through training and formal education, catalyzing the creation of new protected areas, and national and global level policy interventions. There have been successes and failures along the way and much has been learnt from both.

Most importantly, these conservation efforts were carried out by the society's staff while yoked in harness with local partners equally dedicated to saving tigers. Through this process they generated information relevant for rational conservation actions in the future. In the past two decades, the conservation world has seen a shift away from the biocentric paradigm towards one that is more oriented towards meeting human demands on nature. In the resulting debates,[8] WCS scientists have played a somewhat adversarial role in challenging this paradigm shift, while proposing innovative alternatives.

Given this background, Tigers Forever is not just an academic construct for tiger recovery. It is an action-plan in response to the frequent challenges thrown at the society by successful entrepreneurs: We love the tiger, but tell us why should our hard-earned money be wasted on a lost cause? Why should donors support conservationists who appear at their doors – hat in hand, every year – bearing more tales of woe? In the world of business, failure is often swiftly punished and success immediately rewarded: why should this not be so in the world of conservation? Why can't conservationists learn from the past and adaptively improve their interventions? Can tiger conservationists isolate and identify critical factors – ones that they have some hope of changing – instead of persisting with a suite of standard 'do-gooder' actions as a matter of faith? And, pointedly, can WCS actually demonstrate through hard scientific data that its own efforts to protect and recover wild tigers are working?

Tigers Forever project is steered by a group of WCS tiger scientists, conservationists and entrepreneurs who back it. The tiger monitoring activities in the field are guided by a technical support group which this author leads. Although Tigers Forever works synergistically with other tiger conservation activities of the society, its initial focus is on five tiger landscapes: Western Ghats of India, Huai Kha Khaeng-Thung Yai forest complex in Thailand, Gunung Leuser ecosystem in Indonesia, Seima biodiversity conservation area in Cambodia and Nam Et-Phou Louey forests of Lao PDR.[9] Explorations are ongoing to expand into more landscapes in Asia. A major WCS partner, Panthera Foundation, backed by entrepreneurs Tom Kaplan and J. Michael Cline, has committed an annual support of at least one million dollars for the next ten years, aiming to leverage multiplier effects from this seed funding. While going into programmatic complexities of Tigers Forever is beyond the scope of this article, key elements that make this project rather unique in the conservation world are highlighted below.

Historically, WCS researchers have been at the forefront of efforts to gather reliable knowledge about tigers to share freely with the conservation community through peer-reviewed science and popular media. A quick survey of scientific literature on tigers shows WCS has led from the front, accounting for 49 out of 74 (two thirds) of all articles. Another illustration: 16 out of 18 rigorous estimates of tiger population density (number of tigers per 100 square kilometres) – information that is critical for assessing population status – have been published by WCS scientists and partners. Further examples include the society's contribution to the efforts to map worldwide distribution of tiger populations[10] and to the coalition against tiger trade at CITIES and other forums.

Even more pertinently, WCS field researchers and associates continuously generate and freely share with the world information vital for

6. G.B. Schaller, op. cit., 1967 and K.U. Karanth, op. cit., 2001.

7. J.G. Robinson, 'Limits to Caring: Sustainable Living and the Loss of Biodiversity', *Conservation Biology* 7, 1993, 20-28.

8. Ibid.

9. www.wcs.org and www.tigersforever.org

10. G.B. Schaller, op. cit., 1967

effecting tiger recovery. Such sharing is not restricted to ecological research. Studies of human dimensions of tiger conservation are being conducted in collaboration with competent social scientists.[11]

Tigers Forever project does not merely aim at slowing down the tiger's decline, it is committed to achieving an average 50% *increase* in tiger numbers across project sites. Most other organizations trying to save tigers hesitate to set such clear, measurable goals. Sceptics think this WCS goal overambitious – a well-known conservationist reportedly joked that the society's biologists must have been on a drug-induced high to set up such a goal. On the contrary, I would argue, given the dynamics of tiger and prey populations, this is a reasonable objective.

A carefully documented WCS study, which used state of the art camera trapping and line transect survey methods across 11 Indian reserves, showed that because tigers annually crop about 10% of their prey populations with an average offtake of 50 prey animals per tiger, their densities are strongly determined by prey densities.[12] This relationship held strongly across ecologically diverse sites, the only exception being a small park in Madhya Pradesh where direct poaching of tigers appears to have resulted in their numbers being lower than predictions based on prey abundance. (A similar situation may have later resulted in the tiger extirpation in Sariska.) Overall, if tiger forests are empty across much of Asia, the key driver of the decline has been the depletion of their ungulate prey by local hunters.

The above study shows that if ungulate prey numbers can be pushed up to limits of 50-60 animals per square kilometre, achievable with reasonable field protection against local hunters, tigers in turn can rebound to their potential of 10-20 tigers per 100 square kilometres within a decade. In the productive deciduous forests of India, Thailand and Cambodia, their biological resilience can potentially result in three to five fold increases (300-500%). However, not all tiger sites may have such high carrying capacities (typically tropical evergreen forests, mangroves and taiga forests of Russia support much lower prey densities, and consequently tiger densities. Furthermore, comparable protection efficiency may not be achievable across all sites. Despite these caveats, given the natural productivity and resilience of tiger populations, the targeted 50% average increase across all Tigers Forever sites may not be an unreasonable goal.

Even more startling are the results of another long-term WCS study of tigers (1991-2000) conducted at Nagarahole, India,[13] which showed that given 'reasonable' protection, even in the face of poaching and other problems at the edges,[14] tiger population densities were at high levels (7.3 to 21.5 tigers per 100 km^2), despite losing about 23% of tigers annually through mortality and dispersal. High levels of reproduction and some degree of immigration ensured this population held steady through a decade; recent work shows the pattern after 17 years of monitoring.

Yet, because of constant media focus on 'direct killing of tigers for trade', the importance of prey depletion as a driver of tiger declines is poorly appreciated by the tiger conservation community. Although WCS is a part of the international coalition against tiger trade, it does not believe that anti-trade operations alone are sufficient for on ground tiger recovery. Most interventions to counter tiger trade necessarily occur in urban centres. They are quite distinct from field patrolling that protects the tiger's prey base and tigers themselves from local hunters. Ensuring such field protection, through all possible means, is thus the top priority at all Tigers Forever sites.

Beyond ensuring protection of source breeding populations of tigers, additional interventions to ensure their longer term viability vary widely depending on the local ecological and social contexts. These are extremely site-specific, resting on a foundation of research and practical experience. Therefore, WCS tiger conservation interventions often radically diverge from the broad-spectrum patent medicine of 'eco-development' heavily promoted by agencies such as the World Bank-GEF combine and India's Tiger Task Force.[15]

The knowledge based site-specificity of such interventions can be illustrated through a comparison of WCS prescription for tiger recovery in the Western Ghats of India with those in the Russian Far East. My prescription for recovery of our tigers in India's Western Ghats includes strict protection against hunting in core breeding areas, elimination of

11. www.wcs.org and www.tigersforever.org

12. K.U. Karanth, J.D. Nichols, N.S. Kumar, W.A. Link and J.E. Hines, Tigers and Their Prey: Predicting Carnivore Densities From Prey Abundance. *Proceedings of the National Academy of Sciences*, USA 101, 2006, 4854-4858.

13. 'Assessing Tiger Population Dynamics From Photographic Capture-Recapture Sampling', *Ecology* 87: 2925-2937.

14. K.U. Karanth, 'Tiger Task Force: Reconciling Conservation With Emancipatory Politics', *Economic and Political Weekly*, 12 November 2005.

15. Ibid.

forest product exploitation and defragmenting of tiger habitats and preventing conflicts through voluntary resettlement of households using incentives. On the other hand, my colleagues in Russia offer a different set of prescriptions for recovering *their* tigers. In fact, the only common element between our strategies is the strict protection of core areas.

The Western Ghat core sites of Karnataka, if protected optimally, can have female range sizes as small as 20-40 square kilometres and potentially support a meta-population of 400-500 tigers, a reasonable number to ensure demographic viability. On the other hand, in the prey-scarce taiga forests of Russia, where female ranges are of about 500 square kilometre size, the area required to ensure survival of such a viable meta-population is around 300,000 square kilometres, extending across the entire Russian Far East and into China.

The habitat necessary for supporting 400-500 wild tigers, which is reasonably free of incompatible human uses (hunting, livestock-raising, forest product collection), potentially exists within the core sites in the Western Ghats. Extending such restrictions to wider areas in this densely populated landscape is not a practical option, given the current land use and developmental compulsions.

On the other hand, habitat necessary to support 400-500 tigers in the Russian taiga can be practically maintained only through regulation rather than banning of existing extractive practices (legalized hunting of ungulates, and forest product collection) of an extremely low-density human population. Nevertheless, both strategies do rest on a location-specific scientific understanding of tiger biology, landscape ecology as well as compulsions of the human society. Both are effective tactics in their own specific contexts under the rubric of the same overall strategy.

Because of quantifiable targets, establishing reliable monitoring protocols to measure the status of tiger and prey populations and human impacts, as well as conservation interventions made, are also integral to Tigers Forever projects. It should be noted that reliability of such monitoring is specified not merely in terms of use of advanced tools such as camera traps, radio-telemetry, genetic analyses or global positioning systems, it also includes employing cutting-edge ideas in the realms of population sampling, modelling and estimation.

Such tiger monitoring is planned at two distinct scales – intensive set of annual monitoring activities directed at 'critical tiger habitats' or 'core areas' in which breeding populations of tigers are expected to rebound, as well as less frequent, lower intensity monitoring of tracks and scats across the 'tiger landscapes' to assess wider 'ripple effects' of conservation interventions. A carefully designed monitoring protocol that involves camera-trapping and DNA-based capture-recapture estimation of tiger density, survival rates, mortality, recruitment, immigration and emigration; line transect or index-based assessment of prey numbers; and monitoring of threats, human impacts and conservation interventions across wider landscapes using 'occupancy surveys', are all part of the Tigers Forever protocol.

The ultimate objective of monitoring is to integrate it with ongoing conservation interventions of the governments and local conservation partners. Such integration can facilitate what businessmen term 'adaptive management': a continual process where learning gets intertwined with management interventions through testing of predictions; and where interventions and their relative degree of utility in terms of influencing measurable conservation targets – in this case increasing tiger and prey numbers and reducing threat levels – are assessed quantitatively, reviewed and refined into better practices.[16]

As a New York based, scientifically rooted organization, Wildlife Conservation Society has both unique strengths and critical shortcomings in addressing issues of global tiger recovery. Therefore, it recognizes that if tigers are to be saved in their native lands, it must work with an array of *effective* local conservation partners. A corollary to this goal is not to get bogged down in ineffective partnerships. Effective Tigers Forever partners form a truly varied mix across Asia. They range from national, state and local governments, local communities and their leaders, conservation NGOs, business and the media.

Almost everywhere across Asia, government agencies involved in forestry, wildlife, land management and law enforcement have legal control over the remaining tiger habitats. Tigers Forever partners work closely with them. In countries such as India and Thailand, where wildlife laws and on-ground capacity for protection are higher than elsewhere (but still inadequate), the society works directly or through its local partner NGOs to assist, strengthen and catalyze their protective actions. Examples of this are the close collaboration of WCS partners with government departments in promoting voluntary resettlement projects in India and in improving wildlife protection and monitoring capacity in Thailand. In Cambodia, Lao PDR and Myanmar, where governments have sought WCS assistance in improving their internal capacity for wildlife protection, this involvement is even more direct.

16. B.K. Williams, J. D. Nichols and M. J. Conroy, op.cit., 2002.

Partnering effective local NGOs involved in tiger recovery interventions is another critical programmatic element, where national laws permit. WCS Russia is involved in active partnerships with associations of hunting leaseholders who control land use and the Indonesia programme acts in concert with Leuser International Foundation (LIF) with its decades of track record in tiger conservation. The WCS programme in India actively partners with a host of small but spunky conservation NGOs that sport a bewildering array of acronyms – Wildlife First, LIFT, Wild Cat-C, Bhadra Wildlife Trust, SWIFT and KWF, which are active around key sites.

Working with village communities to rationalize or compensate resource extraction levels is a project component where such legal extractions impinge on critical livelihood issues. Such community collaborations are exemplified by negotiations with Cambodian resin tappers who supply the boat building industry in Viet Nam, mitigating livestock losses in Lao PDR, and enabling local forest rights in northern Myanmar. However, such community conservation components are not generic, do-gooder activities typical of most integrated conservation and development projects (ICDP) but are tied to reducing threats to tigers at these sites.

The world conservation scenario today is replete with dire predictions about how the tiger is doomed to extinction: a telephone response survey showed that 93% of viewers of a popular Indian television channel believed that tigers are 'doomed'. Yet, on the other hand, many 'conservation models' are contending aggressively, marking off territories, much like the big cat itself.

Models that promote 'sustainable use of tiger habitats' in combination with some sort of 'eco-development' activity, are favoured broadly by governments, multilateral donors and many NGOs that describe themselves as pro-people. This model is also favoured by officials who implement tiger conservation for various reasons.[17] Another contrasting model promotes 'tiger-farming' as a supply-side solution to tiger scarcity. This one is promoted by an odd alliance of Chinese officials, neo-conservative think tanks and left-oriented media. Some others are demanding a return to centralized, old-style preservation, with no questions asked.

Somewhat differently, Tigers Forever proposes a 'business plan' for tiger recovery. The plan is rooted in tiger ecology first and foremost, because any species can only be saved if its ecological needs are met. It aims to conduct a series of social, managerial and ecological experiments across Asia with starting conditions rigorously specified. It sets clear timelines and rigorous methods for measuring success (or failure). Wildlife Conservation Society's tiger biologists – George Schaller, Alan Rabinowitz, Dale Miquelle, John Goodrich and myself, view Tigers Forever as an extension of our multi-decadal effort to understand *and* save wild tigers. As scientists, we are trained to deal with an uncertain world by constantly validating our 'models of reality' against samples of data from that real world. I believe this approach holds much promise whether it is in the world of quantum physics or tiger conservation.

17. K.U. Karanth, op. cit., 2005.

Communities and conservation

HARINI NAGENDRA

PROTECTED areas have become a cornerstone of conservation efforts across the globe. Beginning with some localized attempts to institutionalize forest protection in the 18th century, 102,102 parks and other protected areas were in existence across the globe by 2003, at least on paper, and protected an area of 18,763,407 sq km, an area equivalent to 12.65% of the earth's land surface.[1] The majority of these parks continue to be managed by national governments, and regional coverages vary widely, with 1,477 protected areas in South Asia reported in 2003, covering about 7% of the land area.[2] However, many of them are in areas close to settled or nomadic populations which rely on resources derived from these areas. Thus, achieving complete government control over their access and use has proved difficult, if not impossible. A variety of management approaches have, therefore, been employed in parks across the world, ranging from complete exclusion to co-managed areas that involve local populations in management, completely community-owned forests, and privately managed areas. Yet, just as achieving complete exclusion appears difficult, it is unusual for local communities to be granted more than limited participation in most areas.

Not surprisingly, this situation has led to people-park conflicts worldwide, which seem to be particularly acute in the densely populated tropics and sub-tropics. South Asia, with highly biodiverse landscapes that have been settled for centuries, provides an illustrative example of these conflicts. There is increasing awareness of the social consequences of creating protected areas in such landscapes, leading to the isolation and exclusion of local inhabitants from traditional ways of life and cultural, social and institutional interactions with nature. Equally, valid concerns have been raised about increasing habitat fragmentation and specie loss in areas where local communities coexist with protected areas.

1. L. Naughton-Treves, M.B. Holland and K. Brandon, *Annual Review of Environment and Resources* 30, 2005, 219-52.

2. S. Chape, S. Blyth, L. Fish, P. Fox, M. Spalding, '2003 United Nations List of Protected Areas', IUCN – The World Conservation Union and UNEP World Conservation Monitoring Centre, IUCN, Gland, Switzerland, 2003.

The relatively small mountain country of Nepal has experimented with various forms of conservation governance in the past. The country displays very distinct physiographic patterns which enable its division into three major zones: the Tarai, the middle hills, and the mountains. Nepal ranks low on the human development index, with a per capita GDP of 1,310 USD in 2001, life expectancy of about 59 years, and adult literacy rates of 43%.[3] The population is predominantly rural, with high population density and accelerated rates of growth. Agriculture is predominantly carried out by small, subsistence farmers who tend to be highly dependent on forests. While state-centred systems of management were extensively promoted in the 1950s, decentralized forms of governance were promoted towards the latter half of the 20th century.[4] A variety of approaches have been adopted over the years, from strict patrolling of national parks by the army, to co-managed buffer areas and community-managed forests. A careful study of the impacts of these different initiatives can provide valuable insights into the potential benefits and challenges of integrating the needs of communities with conservation in South Asian contexts.

Organized forest management on a large scale began in Nepal around 1880, with establishment of forest inspection offices and timber offices throughout the country.[5] A central forest management office was subsequently opened in 1924 at the national level, and managed by the ruling Rana dynasty. However, although these official structures and institutions did exist, most of the forests of Nepal were not under state control, but rather under *de facto* community control prior to the mid-1950s. Traditional and indigenous practices of forest management were prevalent in the Nepal hills during this period.[6] Since population sizes were small, and forest resources relatively large, the pressures on the forests were nowhere near the levels which exist today.

After the fall of the ruling Rana dynasty in 1950, these traditional land and forest holding systems were de-recognized. The Nationalization Act of 1957 brought all forest land, as well as all trees planted on private land, under government ownership. This control over forest resources was further emphasized by successive legislation, including the 1961 Forest Act, the 1967 Forest Protection Act and the 1970 Forest Product Rules.[7] With this, local control over forest resources was replaced by a central governance system.

Lack of forest ownership resulted in reduced incentives for people to preserve the forest. The state control over public forest lands was, however, rather weak and ineffective in regulating forest access, in some cases, even corrupt, and implicated in illegal extraction. Thus, as is argued for large parts of India, nationalization had the unintended effect of creating open-access resources where formerly limited-access common property existed.

Awareness of the negative impact of nationalization on forest cover, a growing appreciation for the capacity of local communities to manage common property institutions, and increasing donor pressure has encouraged the Nepali state to begin to reverse this process since the early 1970s. After unsuccessful early experiments with handing some forests over to local governments in Nepal, extensive attempts were initiated to engage the communities with forest management in the form of community forestry, leasehold forestry, and park buffer zone projects.

The first significant step towards adoption of community forestry approaches was taken during the ninth forestry conference held in Kathmandu in 1974. With support from international donor agencies, including the World Bank, the Nepal government initiated this process by promulgating panchayat rules. The National Forest Act of 1976, and its subsequent amendments of 1977 and 1978, attempted to return some degree of

3. United Nations Development Programme, *Human Development Report 2003*, Oxford University Press, New York, 2003.

4. A. Agrawal, C. Britt and K. Kanel, *Decentralization in Nepal: A Comparative Analysis*, ICS Press, Oakland, CA, 1999.

5. S. Palit, Comparative Analysis of Policy and Institutional Dimensions of Community Forestry in India and Nepal, Mountain Natural Resources Discussion Paper Series No. MNR 96/4, International Center for Integrated Mountain Development, Kathmandu, 1996.

6. D.A. Messerschmidt, 'Conservation and Society in Nepal: Traditional Forest Management and Innovative Development', in P.D. Little, M.M. Horowitz, A.E. Nyerges (eds), *Land at Risk in the Third World: Local Level Perspectives*, Westview, Boulder, CO, 1987, pp. 373-397.

7. J.T. Heinen and S.K. Shrestha, 'Evolving Policies For Conservation: A Historical Profile of the Protected Area System of Nepal', *Journal of Environmental Planning and Management* 49, 2006, 21-28.

ownership and control over forest resources to the people. However, this attempt at decentralization, despite formal links with centrally defined local government structures, was not really successful in practice and unsurprisingly did not achieve much.

The attempts at decentralization were supplemented by the introduction of the Community Forestry Act in 1993. These policy changes represent some relaxation of government control over forests, and coincide more generally with larger political changes within the country – from absolute to constitutional monarchy and democratic rule. Despite these encouraging changes, the existing models of community involvement have been conceptualized by the state with formal expansion of the programmes largely funded through external donor agencies. Local actors had at best limited control over the planning or implementation of these efforts.[8]

Despite these critiques, in general the expansion of community forestry has greatly improved overall relations between the Forest Department and local people. Community forest user groups are self-governed autonomous entities and can independently manage their forests based on approved management plans, with the proviso that they spend 25% of their income on forestry development and conservation. This has contributed to an overall feeling of ownership of forests by local communities. By the end of 2003, 18% of Nepal's forested area was being managed by local communities.[9]

Nepal displays very distinct physiographic patterns which enable its division into three major zones: the Terai plains, the middle hills, and the high mountains. There has been substantial regeneration of forest cover in the middle hills as a consequence of community forestry, albeit patchily. This has resulted in increased access to forest products and provided a greater flow of economic benefits to local communities, strengthening local institutions and contributing to the renewal of ecosystem services.[10] Yet, these positive reports remain mostly confined to the middle hills, where local indigenous systems of management have been in existence for decades, in some locations centuries. In the Terai plains, vociferous policy debates have raged about the suitability of community forestry approaches, citing obstacles such as the large size and increased ethnic heterogeneity of forest user groups, the high timber value of these forests, and the need to create and support new local institutions for forest management.[11]

Alongside these initiatives and policy changes, Nepal's first formal efforts at conservation were initiated in 1973 with the passing of the National Parks and Wildlife Conservation Act. The act led to the establishment of the Department of National Parks and Wildlife Conservation (DPNWC), provided broad legislation for the protection of areas and species, and began the process of formal declaration of protected areas in the country. Currently, there are a total of 16 protected areas in Nepal. Along with designated and proposed buffer zones, these areas cover an astonishing 18% of the total area of the country.[12] They have remained relatively well protected from the waves of deforestation and degradation that took place across the country after the 1960s.

The distribution of these protected areas is, however, not well spread across the major ecosystem types in the country, and is skewed towards high altitude areas, with comparatively lesser representation in the Terai, and areas in the densely populated middle hills remaining highly under-represented. There are large tracts of forests in some areas outside the protected area network which are under the legal jurisdiction of the department of forests. These forests play a critical role in wildlife conservation, serving as corridors to connect some isolated wildlife reserves, as well as providing important additional habitat for animal and plant species.

While the National Parks and Wildlife Conservation Act of 1973 was fairly restrictive in permitting the exercise of customary rights and extraction of forest products, the third amendment to the act in 1986 relaxed some control, allowing for the designation of conservation areas managed for conservation as well as for development, and permitting greater use of forest products by people living around these areas. In 1993, the fourth amendment to the act was passed, allowing for the establishment of buffer zones surrounding parks or wildlife reserves that permit the extraction of forest resources on a regular basis by local people.

While these amendments represent a significant step towards more participatory forest management policies by the Nepal government, turning over limited control to local community user groups, the structure remains largely top-down and hierarchical, with government officers maintaining control over the functioning of the user groups and retaining the power to dissolve the committees at any time. An interesting provision within this programme is that a significant proportion – 30% to 50% – of the revenue generated by protected areas (mainly through tourist fees) is given to user groups for community development.

Two national parks in Nepal have been locations of significant and well-publicized efforts to involve communities with conservation efforts and mitigate park-people conflicts. In the Terai, the Chitwan National Park (CNP) is a Unesco World Heritage Site, and one of the few remaining vestiges of the Terai region which formerly extended over the foothills of Nepal and India. Despite being a former hunting ground, the park constitutes one of the last bastions of the Asian one-horned rhinoceros, and is also a critical location for conservation of the Bengal tiger.[13] Buffer zone projects were first initiated in the Chitwan in the mid-1990s, supported by the UNDP People and Parks Project. This was subsequently extended to other parks in the Terai and in the mountains.

The Annapurna region of Nepal contains some of the world's highest peaks, and an impressive range of ecological habitats from sub-tropical sal forest to perennial snow-covered areas. An integrated conservation and development programme was initiated in this region in 1986, and formalized after the legal establishment of the Annapurna Conservation Area (ACA) in 1992. A careful examination of the experiences of these two programmes, located in regions of Nepal that are very different in their biophysical, ecological, and cultural attributes, can provide valuable insights into the potential and pitfalls for future integrated initiatives in South Asia.

The CNP, established in 1973, is Nepal's oldest protected area. It was formerly managed as a hunting reserve for the royal family, and is now strictly protected by the Nepal Army. Local people are allowed to enter the park for a short period every year, but for the most part entry and extraction of forest produce is heavily restricted. The park is surrounded by a population of over 300,000, and there were fairly severe park-people conflicts that ensued from rigid park protection policies prior to the mid-1990s.

The DNPWC began implementing the buffer zone parks and people programme in the Chitwan and in other protected areas of Nepal in early 1995 to fulfil two primary objectives: socio-economic well-being of the buffer zone communities, and biodiversity conservation of the parks and surrounding forests. This programme received financial and technical assistance from the United Nations Development Programme (UNDP) until 2004, and was later rechristened the Participatory Conservation Project.[14]

Following the initiation of the programme, buffer zone forests were delineated by wardens, and handed over to user group committees with the authority to manage these forests in accordance with the buffer zone management guidelines. These communities have the apparent potential to earn significant incomes from ecotourism. Two of the most 'successful' cases of buffer zone forestry (Baghmara and Kumrose forests), which are much publicized as success stories of this policy intervention, have received substantial technical and financial inputs from several national and international conservation agencies, including the Biodiversity Conservation Network and the World Wildlife Fund.

These forests are located near the main entrance of the park in Sauraha, and are easily accessible to tourists. Though the user groups which manage these forests do gain significant incomes from ecotourism, the forests located at a distance from the park entrance have much less tourist traffic and struggle along with lower incomes, unable to hire external guards or engage in community development activities to the same level.

Thus the real impact of the programme in terms of improving participation and forest conservation equitably across the park is questionable. Recent satellite image analysis has shown that while there has been substantial regeneration in the buffer zone after the mid-1990s, equally there was substantial degradation and loss in forest quality within the park boundaries due to continued human pressure from the surrounding settlements.[15] There have also been reports of continued poaching of wildlife, especially in the recent past following the breakdown of government control during the height of the Maoist insurgency.

The ACA is the largest protected area in Nepal, covering 7629 sq km. In the ACA, the Conservation Area Management Regulation ratified in 1996 officially recognized the formation of conservation area management committees, which were given the

8. A. Agrawal and E. Ostrom, 'Collective Action, Property Rights, and Decentralization in Resource Use in India and Nepal', *Politics and Society* 29, 2001, 485-514.

9. A.P. Gautam, G.P. Shivakoti, E.L. Webb, 'A Review of Forest Policies, Institutions, and Changes in the Resource Condition in Nepal', *International Forestry Review* 6, 2004, 136-148.

10. Ibid.

11. H. Nagendra, 'Tenure and Forest Conditions: Community Forestry in the Nepal Terai', *Environmental Conservation* 29, 2002, 530-539.

12. J.T. Heinen and S.K. Shrestha, op.cit., 2006.

13. N. Bhatt, 'Kings as Wardens and Wardens as Kings: Post-Rana Ties Between Nepali Royalty and Park Staff', *Conservation and Society* 1, 2003, 247-268.

14. H. Nagendra, B. Karna and M. Karmacharya, 'Cutting Across Space and Time: Examining Forest Co-management in Nepal', *Ecology and Society* 10(24), 2005. [online] URL: http://www.ecologyand society.org/vol10/iss1/art24/

15. Ibid.

authority to oversee conservation and development activities at the level of village development committees (the smallest administrative unit in Nepal). The formation of these committees had, however, already begun in 1986 when the initial pilot project was started in the region. The committees comprise a mix of elected representatives and members nominated from various disadvantaged and special-interest groups, with a term of five years. The ACA staff provide technical inputs to the committees, and assist in enforcing regulations in situations of conflict. The project intends to hand over complete management control to the committees within the next few years.

Some interesting patterns in the behaviour and development of these committees over time have been discerned.[16] The longer a committee is in place the greater is its institutional strength, showing an increase in the number of meetings held, greater autonomy in decision-making, and greater representation of women on the committees. Interestingly, while more recently formed committees focused on development related activities that presented themselves as urgent, short-term imperatives for the community, the older, established committees focused on institutional organization, rule-making or capacity building. More critically, those committees in existence for longer periods, between 10-16 years, focused on conservation related activities such as planting, managing plant harvest and wildlife population management.

Thus while integrated conservation and development programmes tend to first focus on development and institutional needs which may appear more pressing, attention shifts to conservation once these developmental requirements have been attended to. This indicates that many researches which suggest that development is taking place at the expense of conservation, may have been because of unrealistic expectations of the time it takes to build the capacity and institutions required to address such seemingly disparate and complex objectives.

Political conflict in the country has also affected these initiatives. Nepal has witnessed significant political instability in the past several years, with the Maoist insurgency having major impacts on conservation.[17] These impacts manifest themselves in various ways. The Nepal Army has been responsible for patrolling parks and wildlife reserves in the country since their establishment in the 1970s. With their reassignment to fight the Maoists in 2001, and increased insurgent attacks on government, national and international agency offices and guard posts, several of the more isolated protected areas remained completely unstaffed during the conflict years; some estimates claim that as few as a third of the guard posts were staffed across the country.

A second issue is that park entry fees significantly declined by as much as 40 to 60% owing to a decline in the number of tourists visiting these areas. Since income from tourism represents a major source for funding development in these areas, this decline created significant obstacles to the sustained functioning of these projects. Problems of top-down implementation of these programmes persist, and there have been contentions that tourism revenues have not flowed back to local communities as promised, leading to significant resentment in some regions, including even the CNP and ACA flagship buffer zone projects of the Nepali government.[18] Finally, development pressures remain an ever-present external danger to conservation activities, and one well beyond the control of local communities. This will become increasingly relevant as the security situation in the country stabilizes, and economic development becomes a critical thrust area.

Interestingly though, despite these stories of gloom and doom, the basic conservation infrastructure has not completely collapsed in Nepal, as has been the case in other parts of the world that have experienced significant political conflict. Community based conservation areas, though by no means immune to this conflict, appear to have proven more resilient to the frequent collapse of law and order when compared to government administered protected areas. For instance, by 2005 most official posts in the ACA region were abandoned.[19] Nevertheless, many of the community forest committees set up under the ACA programme continued to operate through this time, as have some of the buffer zone committees near the CNP, and indeed as reports indicate for community forestry user groups from several parts of Nepal – indicating the potential for sustainability even in the face of violent conflict, and the uncertain nature of funding from tourism.

16. N. Baral, M.J. Stern and J.T. Heinen, 'Integrated Conservation and Development Project Life Cycles in the Annapurna Conservation Area, Nepal: Is Development Overpowering Conservation?' *Biodiversity and Conservation*, Online First, DOI 10.1007/s10531-006-9143-5, 2007.

17. N. Baral and J.T. Heinen, 'The Maoist People's War and Conservation in Nepal', *Politics and the Life Sciences* 24, 2006, 2-11.

18. P. Budhathoki, 'Linking Communities with Conservation in Developing Countries: Buffer Zone Management Initiatives in Nepal', *Oryx* 38, 2004, 334-341; Baral et. al., op. cit., 2007.

19. B. Campbell, 'Nature's Discontents in Nepal', *Conservation and Society* 3, 2005, 323-353.

This provides broader insights into the potential for the integration of communities with conservation. Community forestry programmes across Nepal appear to have achieved reasonable success with regard to the long-term sustainable management of forest resources.[20] In contrast, the conservation and development programmes in Nepal's protected areas, including the ACA and the CNP, have proved more flexible than government administered areas, but still face challenges of survival beyond the funding period of international projects since they have largely been dependent on external technical, financial and administrative support from the government and from international and national conservation agencies. They face challenges that include largely top-down management, low accountability to local communities, lack of effective distribution of finances to user groups, and external pressure from development projects taken up by the government.

Institutions need to have the time and opportunity to learn and grow, as also the flexibility to modify rules based on changing local environments and circumstance.[21] Upwardly accountable and externally enforced rules tend to be relatively inflexible and appear unable to adapt to changing social or biophysical conditions that require changed management practices. Rarely is this taken into account, given the tendency of national governments including India to create relatively inflexible one-size-fits-all rules, thereby limiting the capacity of local communities to adapt to change – a factor essential for long-term sustainability.

Further, externally implemented institutions do not make their way in a vacuum but are instead transplanted into a pre-existing social context of norms, customs and rules. Local cultural differences act in conjunction with geographic peculiarities, and lead to situations where even neighbouring communities can face dissimilar pressures on their forests, necessitating the adoption of different institutional rules for effective management.

At a time when the Nepal government is considering expanding the programme to cover several other national parks, this raises doubts about their long-term sustainability. International and national conservation agencies have invested significant amounts of money, manpower and technical support into integrated conservation and development initiatives in Nepal. However, the high degree of external financial and technical inputs provided by government and international aid agencies, short project funding cycles and planning periods, limited ability to adapt within these time periods, lack of provision for variability in management or adaptation to different geographic, ecological and cultural contexts – all restrict the long-term sustainability and viability of these programmes.

Ensuring true community participation is crucial for continued success of programmes that attempt to integrate the needs of communities with those of conservation even in the absence of sustained international donor support. Else, while these efforts may be successful in maintaining biodiversity in limited protected park areas, they will neither prove sustainable without large funding, nor capable of the eventual goal of expansion to cover all protected areas in Nepal.

20. E. Ostrom and H. Nagendra, 'Insights on Linking Forests, Trees, and People From the Air, on the Ground, and in the Lab', *Proceedings of the National Academy of Sciences of the United States of America* 103, 2006, 19224-19331.

21. Ibid.

Interview

R.S. Negi *is a leading environmentalist of Kinnaur.* **Rinki Sarkar** *is a Visiting Fellow at the Centre for Interdisciplinary Studies in Environment and Development, Bangalore. The focus of her research is on unearthing adverse environmental consequences of development and change in the Western and Central belts of the Middle-Himalayas. In this wide-ranging interview, Rinki Sarkar engages R.S. Negi on the vexed question of coping with the exigencies of development and change in the ecologically fragile belt of the Western Himalayas.*

What is the nature of development and change that is occurring in Kinnaur over the last few decades?

Economically, there has been a sea change. Due to persistent efforts of the local community, progress in the sphere of horticulture has been quite remarkable. Improvements in the road network and better irrigation facilities have certainly triggered off these developments. As you may be aware, Kinnaur is a tribal area. A number of locals in the region have secured access to employment opportunities in government departments because of the 'reservation policy'. However, concomitant to these changes, adverse environmental consequences have arisen.

In what respects?

Throughout this period of development and change, road construction activities have damaged forests. Once gone, these forests are gone forever. Now, we have new mega-hydroelectric projects coming up that are encroaching upon vast tracts of forest land besides diverting the natural course of rivers and water systems. The focus seems to be merely on expropriating commercial gains associated with such projects. There is little concern and only partial knowledge about repercussions on the environment and damage caused to local inhabitants in the surrounding vicinity. We are collectively agitating against these developments.

In order to identify the affected population, stress is merely being laid on 'submergence' criteria. But locals are also affected by blasting of tunnels which is an essential element of these 'run-of-the-river' based technologies. Villagers have been complaining that incisions made to the mountain facade are drying up water springs vital for their livelihood. Dynamite blasting causes noise, vibrations and is a potential threat to land and property. Further, it weakens the sloped mountainous terrain, making the affected region more prone to landslides. Unfortunately, geologists engaged to assess the nature of damage pass such disasters off as 'natural calamities' unrelated to project construction activities. So no compensation is sanctioned.

Are people ignorant about these sorts of developments?

Yes. People are very innocent in the mountains and they are kept in the dark.

How was horticulture promoted in this region?

The basic drive came from the neighbouring Kotgarh region in Simla district where horticulture was initiated for improving local economic conditions by a philanthropist named Satyanand Stokes. The government has also played an important role by distributing inputs at subsidized rates and enhancing road-connectivity for better marketing of the produce.

In Simla district, there is evidence of massive illegal encroachments into the forests for expanding horticulture, a classic example of how commercialization pressures can transform the natural environment in the vicinity of villages. What is the scenario in Kinnaur?

Fortunately, this is not the case in Kinnaur as landholding constraints were less binding for experimenting with horticulture. Further, farmers usually fetch a high off-peak price as Kinnaur is located at a relatively higher elevation as compared to other apple producing belts in the country and the fruit reaches the market at a much later date. Consequently, there is less pressure to opt for extensive methods of cultivation by encroaching into forests.

Kinnaur district is being propagated as a potential tourist destination. Could this have a negative implication for the region?

At present, the scale of tourism is very low. We have bad roads that deter most tourists from coming into the region. Therefore, the tourist season is limited to a few months.

In course of my field visits, people expressed concern about the recurring occurrence of cloudbursts which cause considerable havoc. These were unheard of in the past. Is that true?

Yes. A cloud burst usually leads to violent and torrential downpour with catastrophic consequences. Earlier we did not experience any such occurrences and this is essentially a post-1980s phenomenon. Rainfall used to be very scanty in summer. But over the last two decades we have been witnessing erratic and heavy rainfall in summer and less snowfall in winter. When the sloped mountain terrain is fragile and loose, excessive rainfall of this magnitude invariably causes landslides. The setting up of hydroelectric projects has aggravated the situation by making the soil structure loose and thus more susceptible to landslides, both directly and indirectly. Directly, because of dynamite blasting and indirectly due to felling of trees that hold the soil together.

Do road construction activities have similar implications for the mountain environment?

Certainly. Roads are also constructed by blasting rocks using dynamite which weakens the soil surface. Wherever forests are encountered during road alignment, trees are mercilessly felled causing soil and water runoff aggravating damage caused in the aftermath of a landslide. The rolling boulders are dangerous and have often caused unforeseen loss of life and property. But the dilemma is that roads are crucial for local area development. National Highway-22 is the prime reason for progress being witnessed in Kinnaur today. It is the umbilical cord that links Kinnaur to the outside world, opening up markets and creating a host of opportunities for the local population.

I agree. But, are thorough geological surveys conducted before roads and hydroelectric projects come up so that there is minimum damage?

If only these surveys were sufficiently thorough, possibly we would not have witnessed such natural calamities. I know for sure that roads are often haphazardly constructed. Most often it is not the insights from geology or ecological prudence that governs these decisions but short-sighted and ill-informed motives.

But I am sure that forests also bear the brunt of demographic change. Is that right?

Yes. The regulated 'timber distribution' system, where a household is entitled to acquire one tree every five years is inadequate to cater to mounting pressures and, therefore, tends to be grossly misused. Timber is perhaps the most suitable material for construction of dwelling units as the region experiences frequent seismic disturbances and extremities as regards climate. There is a growing demand for timber as old dwellings are demolished to make way for more spacious units with changing village morphology. The earlier compact villages around a temple core are giving way to a more scattered kind of settlement pattern where it is crucial to live close to one's orchards for nurturing the plantations which is an all-year round activity. The breakdown of the joint-family system has also increased the need for more dwelling units in the village. The shortfall in timber requirements is usually met through the black market where timber acquired through illegal felling operations is sold. Thus actual timber extraction levels far exceed the planned levels, posing a great threat to forests.

Similarly, firewood needs can no longer be satiated by restricting lopping to dry branches or fallen twigs alone. Wet lopping that is very harmful to the growth of trees is a common sight. These unsustainable practices are attributable not only to an increase in the local population but also to an influx of migrant labourers who have come to work on hydroelectric projects.

Since forests are so intricately linked to local livelihood, why don't people object when their forests get taken over for project purposes?

Because, very often such damages are unanticipated. Take the case of the 100 megawatt Tedong hydroelectric project. Nearly 13000 precious deodhar *(Cedrus deodara)* and endangered neoza *(Pinus geradiana)* trees will need to be felled for project related road construction activities. Regenerating a forest of this nature will take at least a hundred years. This mammoth scale of destruction could have been avoided had more sustainable means of transportation, such as 'spans' (ropeways), been planned. Similarly, there would have been less damage to the fragile terrain if less destructive tunnelling technology was used. In European countries, use of environmentally benign technology such as tunnel boring machines (TBM) is the norm; there is no dynamite blasting involved.

Are these 'alternate' technologies more expensive?

The costs of the project would mount a bit. So what? At least there would be less threat to the environment. With the latest tunnel boring technology, forests, fields and dwellings would get saved. Can you imagine the magnitude of intangible benefits that would accrue?

Are you resorting to legal tools for defending your cause, particularly in the name of livelihood related rights and environmental protection?

We are resorting to Article 21 of the Constitution which encompasses 'right to life'. The article propounds that if pollution is being generated due to a project or livelihood is affected then it amounts to denying right to life. Articles 46, 47, 48, 51A are all in our favour, legally and constitutionally. We have brought this to the notice of the authorities.

I would like to add that there are also problems related to national security as this region is close to the border. About nine to ten mega hydroelectric projects are expected to come up near border areas close to Tibet. These fall in the 'artillery-range'. So there is a grave threat to life and property in case of a strike. After our periodic outcries the Khab project has been stalled for some time on grounds of national security.

What are the main issues that you are fighting for as regards the Karcham-Wangtoo project?

The main issue is that locals affected by submergence problems have been taken care of, but no cognizance is being taken of those villages that are susceptible to damage on account of tunnel-blasting. Further, the proposed compensation does not take care of damage that affects future livelihood. It is limited to the nearest time horizon. Other issues which are much harder to quantify are threats to national security and long run environmental impacts. How these are to be taken care of remains unclear.

Compensation is one concern. Do villages in the locality benefit from the electricity that is generated?

No. The state government is supposed to get 12% of the electricity generated; the rest goes to the national grid. We are demanding that the state share be increased from 12% to 25%, so that some of this electricity can be channelled to the local area, free of cost.

During my field-research work, I realized that there are some beneficial consequences of these projects that cannot be disregarded. For instance, villages in the proximity of these project locations benefit from a growing market for milk, vegetables, local liquor and transport services. This perhaps may be one reason why the local people are more willing to live with the negative implications of these projects. What are your views on this matter?

Yes, to some extent, but these ancillary benefits are temporary. Once the project is completed the construction company will go away.

Since the commercial stakes in these projects are very high for the government, can measures be taken to minimize the undesirable consequences?

Yes, of course. The use of environmentally benign blasting technology can make a big difference. In case of most projects, water is not being released from the dam site. Even if 25% of the water is released, the environmental impact will be less severe. We are not saying that projects should not come up. We believe in sustainable development. Sustainable development is not to be equated with 'no development'. But we are pleading for a balanced approach that causes minimum damage to the environment.

Since electricity is a basic need for development it should be priced accordingly. We believe that states elsewhere that are benefiting from our hydroelectric power should pay a higher price for electricity consumption. If the generated electricity is under-priced, there will be no motivation to conserve. The price should cover not only generation costs but social and environmental costs as well. We are demanding that a part of the receipts should be invested in the affected areas to overcome damages to life, livelihood and the environment. The equation is fairly clear. Isn't it?

Safety Net Programmes: Outreach and Effectiveness

The safety net programmes, which are designed with three main purposes, protection (ex post), insurance (ex ante) and poverty alleviation, offer help to households during a period of crisis. This article evaluates the efficiency, awareness, participation, targeting and distributive outcomes of these programmes, based on household/village-level surveys conducted in Orissa, Madhya Pradesh and Karnataka. In addition, the article pays special attention to the functioning of village-level institutions and social capital. Besides giving an overview of the risks and shocks faced by households in these states, the article shows that the current safety net programmes do not seriously address the health risk.

S Mahendra Dev, K Subbarao, S Galab, C Ravi

Safety nets are non-contributory transfer programmes targeted at the poor and those vulnerable to poverty and shocks. These programmes help households manage risks. Within this overall role of safety nets, programmes are usually designed with three main purposes: protection (ex post), insurance (ex ante) and other considerations like poverty alleviation (targeting the transient poor and chronically poor), income redistribution and aiding economic growth [Subbarao 2003]. These motivations are complementary, and often overlap. For example, a programme with protection motivation could also alleviate poverty. In addition, the recent theory and evidence "offers a new perspective on social protection policies in poor countries, suggesting that there is scope for using these policies to compensate for the market failures that perpetuate poverty, particularly in high-inequality settings" [Ravallion 2003, WDR 2006]. Moreover, well-designed safety nets may also promote high risk/high return private investments by the households, and prevent adverse welfare outcomes (such as pulling children out of school) during periods of acute shocks/crises.

The state has a role to play in the design, financing and execution of safety net programmes in all countries, both developing and developed, though the extent of state involvement may vary with the level of development of a country and the degree of uninsured risk faced by households [Subbarao et al 1997]. In India, providing some measure of income security and ensuring a minimum level of well-being to the poor has been a central plank of public policy since independence. Towards this end a number of safety net programmes, known popularly as anti-poverty programmes, have been launched. The number and diversity of anti-poverty programmes has grown enormously, with the state governments often introducing their own programmes in addition to those sponsored and funded by the central government. India spends annually about 2 per cent of the gross domestic product (GDP) on such programmes financed by the central government.

This paper examines some aspects of safety net programmes in three states, viz, Orissa, Madhya Pradesh and Karnataka based on household (hh) and village surveys. A special household survey was conducted in these three districts in 2005-06. Two blocks from each district and, five villages from each two blocks were selected. Thirty households per village (12 hhs participating in programmes and 18 hhs randomly) were selected. Thus we have a total of 1,356 sample households in nine districts covering three states. Focus group discussions in the village (separately for men and women) include interviews with block development officers and NGOs and, case studies. The collected data at the household level enabled us to construct indexes on asset, social capital and women's participation.

The study has relevance in the context of the common minimum programmes' (CMP) emphasis on effective implementation of safety net programmes. This has been restated and reinforced in the approach paper of the 11th Five-Year Plan [GoI 2006]. This study contributes to the existing literature by dealing simultaneously with four aspects reflecting on programme efficiency: awareness, participation, targeting and distributive outcomes (benefit incidence). While past research has focused on one or two of the above-mentioned aspects of programme efficiency, few studies have dealt with all aspects. In addition, this study also complements a quantitative analysis with a brief qualitative analysis based on the focus group discussions and household-level as well as village-level analysis paying particular attention to the functioning of village-level institutions and social capital. We have also taken the opportunity to elicit information on household risks and shocks.

It is important to state the limitations of the study at the outset. First, due to time and resource constraints, only a small household questionnaire could be canvassed, which did not include a consumption module. However, detailed questions were canvassed on assets so we could construct a wealth/asset index which formed the basis for our distributive-share analysis. Second, not all programmes could be analysed. The programmes analysed depended on the extent and intensity of their operation which varied a great deal across the three states. Third, the quantitative analysis was limited to those aspects where there was a critical minimum sample size. Because of these limitations, the study does not purport to offer a

comprehensive treatment of all safety net programmes operating in the three states.

The paper is organised as follows. First section provides an overview of risks and shocks faced by the households in the three states. Awareness of anti-poverty programmes is discussed in Section II, followed by participation (Section III), targeting and benefit incidence (Section IV) and qualitative analysis (Section V). The last Section (VI) provides conclusions and draws some inferences for policy.

I
Household Risks and Coping Strategies

When all idiosyncratic risks for all states are considered together, sudden health problem dominates as the principal risk for all quartiles (Table 1). Under covariate shocks, drought dominates other risks followed by cyclone/flood for all quartiles. The percentage of households reporting drought risks is about the same for the bottom two quartiles but increases for the top two quartiles (Table 1 columns 16-20, row 1). As for health risk, the proportion reporting is substantially higher for the poorer two quartiles compared with the top two quartiles. For the poorer two quartiles, drought and health risks are followed by death of a family member or livestock epidemic. For the richer two quartiles, the percentage of households reporting cyclone/flood and pest attack is also high. When all states are taken together, it is interesting that the proportion reporting "robbery and violence" is small, but the proportion, though small, is twice as large for the poorest two quartiles compared with the top two quartiles – a clear reflection that failure to maintain law and order hurts the poor more than the non-poor.

Risk patterns vary by states. In the case of Orissa, the proportion of households reporting sudden health risk is more or less similar across quartiles, and it dominates all other risks for the bottom two quartiles. The proportion reporting weather risks is somewhat lower for the poorest quartile as compared to rich largely because they own less (or no) land asset.

In Madhya Pradesh too, the proportion of households reporting health shocks is high for the bottom two quartiles (and it dominates all other idiosyncratic shocks), but unlike in Orissa, it falls to less than 17 per cent for the richest two quartiles. Also a much higher proportion of households experienced a drought risk in Madhya Pradesh than in Orissa, and that proportion rises sharply for the richest two quartiles.

In Karnataka, in the poorest quartile, a much higher percentage of households (50 per cent) reported drought risk than in the other two states; the proportion falls for the upper quartiles though still quite high. Like in Orissa and Madhya Pradesh, a high proportion of households in the poorest quartile reported sudden health shock as a major risk factor.

We show the relative importance of various risks in the three states and for all states combined (Figures 1, 2, 3 and 4). In the relatively more developed state like Karnataka, the incidence of health risk is about one half of the incidence of drought (which is not surprising because Karnataka has a large proportion of arid zone) whereas in a relatively poorer state like Orissa health risk dominates (which is also not surprising given the preponderance of malaria) alongside covariate risks. Madhya Pradesh is somewhere in between – health risk is about two-thirds of weather-induced covariate risks. Another interesting difference is that in Orissa not only is health risk hitting humans, but it is also hitting livestock – highest proportion of households experienced epidemics of livestock in Orissa in comparison with the other two states.

Figure 1: Percentage of Households Reporting Different Risk Events (Orissa)

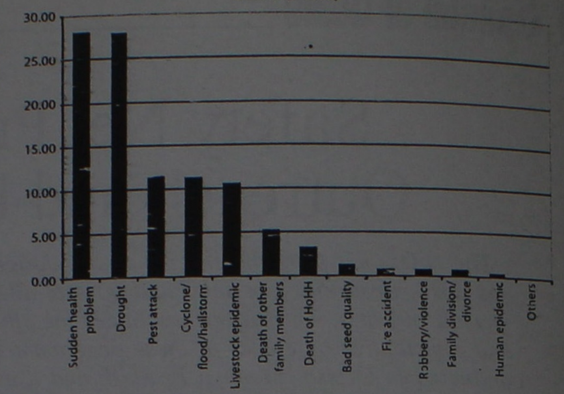
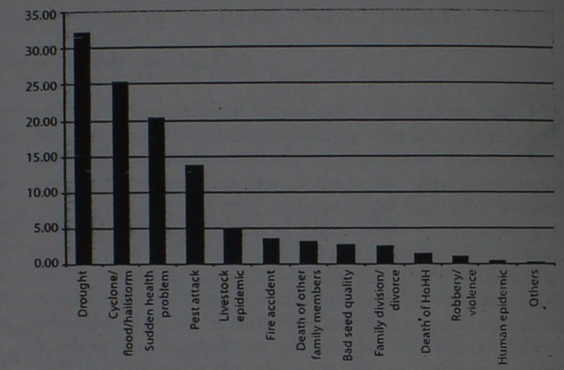


Figure 2: Percentage of Households Reporting Different Risk Events (Madhya Pradesh)



Using a logit model, we examined the factors that determine idiosyncratic and covariate risks experienced by households. The results show that the wealth index has a significant negative relationship with idiosyncratic shocks (Table 2), confirming its dominance for all poor households. Scheduled castes and other backward castes (OBCs) have a significant positive relationship with idiosyncratic risks. Moreover, the probability of a household experiencing an idiosyncratic shock is higher if that household happens to be located in Orissa than in other states.

It is not surprising that wealth index and landownership have a positive relationship with covariate risks, reflecting the fact that the richer landowning classes have higher probability of drought or flood risk as compared to poorer households most of whom own no land or very little land. However, the schedule castes (most of whom are engaged in agricultural labour activity) have a significant positive relationship with covariate risks. The probability of a household experiencing a covariate risk is higher if located in Madhya Pradesh than in other states.

II
Awareness of Safety Net Programmes

In the household questionnaire, the questions regarding awareness and participation are: (a) Are you aware about the following programmes? (b) If yes, did any member of the household participate in this programme during the last three

Figure 3: Percentage of Households Reporting Different Risk Events (Karnataka)

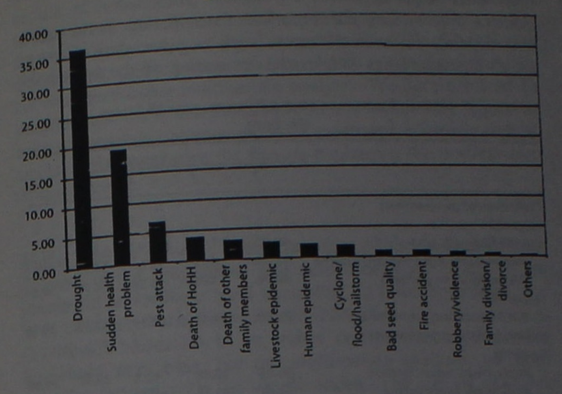
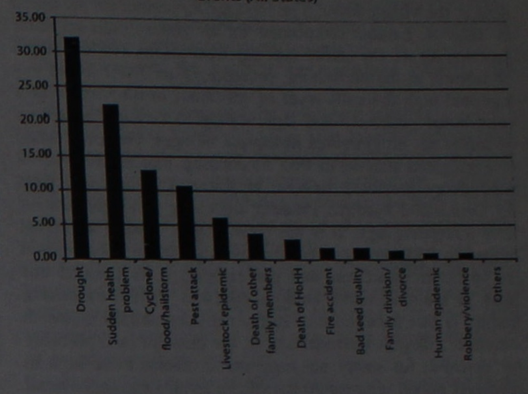


Figure 4: Percentage of Households Reporting Different Risk Events (All States)



years? (c) Who in the household participates/participated in these programmes? The survey covers 25 safety net programmes; most of them being centrally-sponsored and funded schemes. The 25 programmes cover four broad categories, viz, cash transfer, in-kind transfer, work fare and subsidy based livelihood programmes. However, only 13 programmes are covered for analysis because of limitations of sample size. We distinguish targeted and universal programmes among these.

Across quartiles, differences in awareness are small for most programmes. In general, for majority of the programmes, the awareness percentage is only slightly higher for the top two quartiles as compared to the bottom two quartiles (Table 3). For example, a slightly lower percentage of households in the poorest quartile are aware of the education-related programmes than the richer ones but the difference is not large. Most of the differences (means) are not statistically significant. What this suggests is that if the average awareness is high in the village for a specific programme, the awareness for all quartiles is likely to be high for that programme.

Differences in awareness between villages. Our survey covers 45 villages. We constructed an awareness index for all programmes at the village level, and used village-level factors as

Table 1: Percentage of Households Reporting Risk Events by the Type of Risk Events and by Quartiles

State	Orissa					Madhya Pradesh				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
	1	2	3	4	5	6	7	8	9	10
Drought	12.39	33.93	30.36	34.82	27.84	22.03	16.22	40.35	50.00	32.17
Cyclone/flood/hailstorm	5.31	14.29	11.61	13.39	11.14	11.86	16.22	35.09	38.60	25.38
Pest attack	1.77	6.25	20.54	16.96	11.36	0.85	6.31	21.93	26.32	13.79
Bad seed quality	0.00	0.00	1.79	3.57	1.34	0.00	1.80	6.14	3.51	2.84
Livestock epidemic	6.19	13.39	11.61	10.71	10.47	0.00	7.21	6.14	7.02	5.03
Fire accident	0.00	2.68	0.00	0.89	0.89	3.39	0.90	6.14	3.51	3.50
Robbery/violence	0.88	0.89	0.89	0.89	0.89	1.69	0.90	0.88	0.88	1.09
Human epidemic	0.00	0.89	0.00	0.89	0.45	0.00	1.80	0.00	0.00	0.44
Death of HoHH	3.54	2.68	3.57	3.57	3.34	0.85	3.60	0.88	0.88	1.53
Death of other family members	4.42	5.36	7.14	3.57	5.12	1.69	2.70	3.51	4.39	3.06
Sudden health problem	27.43	29.46	25.89	29.46	28.06	27.97	24.32	17.54	11.40	20.35
Family division/divorce	0.88	0.89	1.79	0.00	0.89	2.54	2.70	2.63	1.75	2.41
Others	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.22

State	Karnataka					Total				
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
	11	12	13	14	15	16	17	18	19	20
Drought	49.56	28.32	33.04	33.93	36.22	27.91	26.19	34.62	39.64	32.08
Cyclone/flood/hailstorm	0.00	0.88	2.68	3.57	1.78	5.81	10.42	16.57	18.64	12.83
Pest attack	2.65	0.88	8.04	15.18	6.67	1.74	4.46	16.86	19.53	10.62
Bad seed quality	0.00	0.00	0.89	2.68	0.89	0.00	0.60	2.96	3.25	1.70
Livestock epidemic	1.77	3.54	1.79	3.57	2.67	2.62	8.04	6.51	7.10	6.05
Fire accident	0.88	0.00	0.00	2.68	0.89	1.45	1.19	2.07	2.37	1.77
Robbery/violence	1.77	0.88	0.00	0.00	0.67	1.45	0.89	0.59	0.59	0.88
Human epidemic	2.65	1.77	1.79	2.68	2.22	0.87	1.49	0.59	1.18	1.03
Death of HoHH	4.42	3.54	4.46	2.68	3.78	2.91	3.27	2.96	2.37	2.88
Death of other family members	4.42	0.88	4.46	2.68	3.11	3.49	2.98	5.03	3.55	3.76
Sudden health problem	30.97	17.70	12.50	15.18	19.11	28.78	23.81	18.64	18.64	22.49
Family division/divorce	0.00	0.00	1.79	0.00	0.44	1.16	1.19	2.07	0.59	1.25
Others	0.00	0.88	0.00	0.00	0.22	0.29	0.30	0.00	0.00	0.15

Notes: Idiosyncratic risks include: fire accident, robbery/violence, death of head of household, death of others in family, sudden health problem, long-term health problems, family division/divorce.
Covariate risks include: drought, cyclone/flood/hailstorm, pest attack, bad seed quality, livestock epidemic, human epidemic.

independent variables to see if these factors influence awareness at the village level. The logit model results are presented in Table 4. Factors (combined for all states) such as better functioning of the panchayat raj institutions (PRIs), status of women in the household, presence of an NGO in the village and high (overall) level of education in the village have contributed positively and significantly to creating awareness of safety net programmes in sample villages. However, when disaggregated state-level PRI functioning indices are used as explanatory variables, relative to Karnataka, the coefficients for Orissa and Madhya Pradesh are either non-significant or have a negative sign. It is not clear why in Orissa (negatively related to PRI) and Madhya Pradesh PRI functioning has not led to better awareness and participation – we pursued this issue in our qualitative analysis (Section V). An interesting finding is that awareness of safety net programmes is low in wealthier villages. Understandably, the concern (and probably the demand) for safety net programmes seems to be high in relatively poorer villages. At the village level, awareness overall is better in Orissa and Madhya Pradesh than in Karnataka.

III
Programme Participation: A Household Level Analysis

Awareness of the programme is a precondition for participation but it does not guarantee participation. This section looks at participation rates at the household level by quartiles based on wealth/assets and by social groups.

All households (all states): The participation rates are more than 60 per cent for in-kind programmes like public distribution system (PDS), Integrated Child Development Scheme (ICDS), mid-day meal and free textbooks. The PDS showed the highest participation rate (70 per cent) among the 13 programmes considered in the study (Table 5). As expected, the participation rates of PDS are higher for below poverty line (BPL) households than for above poverty line (APL) households. On the other hand, the higher awareness rates notwithstanding, the participation rate is less than 10 per cent for programmes like the Antyodaya Anna Yojana (AAY), Sampoorna Grameen Rozgar Yojana (SGRY), food for work and Swarnajayanti Gram Swarojgar Yojana (SGSY). For pension schemes it is around 30 per cent. As for differences between the states, participation rates for all households are higher in eight programmes in Orissa than in Madhya Pradesh and Karnataka. It is a source of concern that only 32 per cent of BPL households participated in the PDS in Madhya Pradesh despite higher awareness. In Karnataka and Orissa, the corresponding participation rate is more than 60 per cent.

Factors determining participation: Participation in the safety nets depends on several factors such as ownership of assets, social characteristics like caste, occupation of the household,

Table 2: Results of a Logit Model of Determinants of Risks Experienced by Households

Variables	Idiosyncratic			Covariate		
	B	SE	Sig	B	SE	Sig
Landowned	0.0031	0.0121	0.7956	0.0240	0.0150	0.1098
Wealth index	-0.0052	0.0015	0.0005	0.0067	0.0015	0.0000
Caste (Ref: Others)						
Scheduled castes	0.4334	0.2244	0.0535	0.6634	0.2038	0.0011
Scheduled tribes	-0.1139	0.2175	0.6004	-0.1709	0.1938	0.3777
Other backward castes	0.5837	0.2066	0.0047	0.4451	0.1834	0.0152
States						
Orissa	0.5223	0.1532	0.0007	0.1731	0.1441	0.2296
Madhya Pradesh	0.0424	0.1554	0.7851	0.4350	0.1425	0.0023
Constant	-0.4515	0.3310	0.1726	-1.8499	0.3218	0.0000

Table 3: Awareness about Programmes: All States
(Per cent)

	Quartiles				
	1	2	3	4	All
Cash transfer programmes					
Targeted					
Indira Awas Yojana	68.02	71.13	68.93	63.61	67.92
National Old Age Pension Scheme	59.59	62.8	57.1	54.73	58.55
Widow/disable pension	60.76	63.99	58.58	54.73	59.51
Universal					
Rural education scholarship	29.65	29.46	28.11	33.43	30.16
In-kind transfer programmes					
Targeted					
Public distribution system	86.05	90.48	92.9	94.97	91.08
Antyodaya Anna Yojana	34.01	33.33	32.84	31.36	32.89
Universal					
Integrated Child Development Services	26.74	33.63	36.98	37.28	33.63
National Mid-Day Meal Scheme	67.73	77.38	78.11	68.93	73.01
Free textbook	60.17	67.56	71.6	68.64	66.96
Free hostel	18.02	30.95	31.07	33.14	28.24
Free uniform	51.16	59.82	62.72	61.54	58.78
Workfare programmes (self-targeted)					
Sampoorna Grameen Rozgar Yojana	25	33.33	30.18	29.59	29.5
Food for work	28.49	29.76	25.74	26.04	27.51
Subsidy based livelihood programmes					
Targeted					
Swarnajayanti Gram Swarojgar Yojana	10.17	16.96	18.93	21.3	16.81

Table 4: Village Level Determinants of Awareness of Programmes

Dependent Variable: Awareness of All Programmes Coefficients(a) Model	Beta	T	Sig
1 (Constant)		-0.128	0.900
PRI functioning index	0.261	1.820	0.087
Social infrastructure	-0.019	-0.122	0.905
Economic infrastructure	0.022	0.146	0.886
HH structural social capital	-0.758	-1.454	0.165
Trust PRI	-0.034	-0.140	0.891
Trust officials	0.204	0.781	0.446
Trust groups	-0.029	-0.179	0.860
Total female participation (elec, meet, etc)	0.246	1.368	0.190
Empowerment	0.548	2.863	0.011
Control on assets	-0.073	-0.487	0.633
Average index	-0.411	-1.754	0.098
Ratio of female and male literacy	-0.126	-0.429	0.673
Per cent of female literacy	0.219	0.595	0.560
Migrated	0.009	0.069	0.946
Presence of NGO in village	0.291	1.907	0.075
Social composition of village (Herfindal)	0.080	0.573	0.575
Per cent of landless	-0.057	-0.150	0.882
Per cent of small farmers	0.036	0.120	0.906
Per cent of HH with at least one educated	0.342	1.817	0.088
Orissa dummy	2.198	2.477	0.025
Madhya Pradesh dummy	1.671	2.255	0.039
Orissa – social capital	0.409	0.988	0.338
MP – social capital	0.597	0.855	0.405
Orissa – women's autonomy and decision-making	-0.949	-1.376	0.188
MP – women's autonomy and decision-making	-1.231	-2.351	0.032
Orissa – PRI functioning	-0.957	-2.039	0.058
MP – PRI functioning	-0.510	-1.040	0.314

literacy, household size, sex of the head of the household, social capital of households, women's autonomy and participation, village level characteristics like social and economic infrastructure, functioning of local councils like PRIs. The factors determining participation of households in the programmes are examined using multivariate analysis. We have selected 13 programmes, for which the sample size is sufficiently large. For each of these programmes we have estimated a logistic regression model to determine the factors explaining the participation of households:

$$P = f(H, V)$$

where P takes value 1, if any member of the household participates in the programme and zero otherwise. H and V are household and village level variables. At household level, we have considered the following variables:

(1) *Wealth index*: It is an index computed based on the household asset base. For the multivariate analysis, we used quartiles formed with the wealth index. The use of quartiles in the regression is found to give better fit than when wealth index is used directly. If the participation of household into any programme is pro-poor, the wealth effect on participation should be negative.

(2) *Caste groups*: Caste is an important factor in explaining the household participation in programmes. With low levels of social and economic attainment, we expect higher probability of participation among SC and ST households.

(3) *Household size*: Ceteris paribus, large households may be expected to be poorer than small households, and so large households may be expected to seek and participate in any safety net programme.

(4) *Sex of the head of the household*: In general, the female-headed households may be expected to participate in safety net programmes more than the male-headed households.

(5) *Percentage of literates in the household*: Households with a larger number of literates may be more likely to participate in child/education centred programmes and less likely to participate in the workfare/livelihood programmes.

(6) *Occupation of head of the household*: We expect higher probability of participation for households predominantly engaged in labour-based activities than self-employed households.

(7) *Household experiencing shocks/risks*: In order to examine the interaction between household experiencing shocks and its participation in the programme, we included variables indicating shocks and risks. We included two types of shocks, idiosyncratic and covariate. It is worth stressing that while the incidence of risks/shocks is for the previous three years, the programme participation is for the current year (of the survey).

(8) *Household structural social capital*: The social capital of the household is computed as the participation of household members in a number of social/political groups. The social capital index indicates the networking ability of the household. We expect that the household with higher social capital is to have higher probability of participating in the programme.

(9) *Women's autonomy and decision-making*: This is an index based on the women's decision-making on various household issues (like child education, marriages, health, savings, investments, etc) and ability of the women to do a few things on her own independently. We expect households with higher women's autonomy to be more likely to participate in the programme.

(10) *Women's participation in meetings and elections*: This index is based on the women's participation and raising issues (any) in the meetings of village councils/education committees/ water user associations and women's participation in the elections (village/block/district/state council and national elections). We expect similar participation in the safety net programme to increase with women's participation index.

We used age of the head of the household (HoHH) and average land size as controls.

At the village level we used the following controls:

(1) *Social/economic infrastructure*: Two separate indices have been constructed to capture the level of village development with respect to social and economic infrastructure. These are used as controls. The households located in the higher social/economic infrastructure may be expected to have higher probability of participating in programmes.

(2) *Functioning of PRIs*: The index of functioning of PRI is based on the regularity of the village council meetings and active participation of SCs and STs. The households in the villages with better functioning of PRIs may have higher probability of participation in programmes.

(3) *Average wage rate in the village*: It is an important determinant of participation in case of workfare programmes and SGSY.

A summary of the variables with their coefficients and statistical significance levels are given for 13 programmes in Table 6. Which factors are generally important for participation in the safety net programmes? The results from Table 6 are summarised below.

(a) *Quartiles*: The quartiles based on assets do not seem to have a significant relationship with the participation in the majority of the programmes. For example, the lowest quartile is significantly positive only for three programmes, viz, widow pensions, mid-day meals (MDM) and free textbooks. In fact, the third quartile is positively significant for three programmes viz, Indira Awas Yojana (IAY), PDS under BPL and mid-day meals.

(b) *Social groups*: On the other hand, the households belonging to socially disadvantaged sections have a significant positive

Table 5: Participation Rates for All HHs: All States and Individual States
(Per cent)

	All States	Orissa	MP	Karnataka
Cash transfer programmes				
Targeted				
Indira Awas Yojana (IAY)	10.57	12.98	10.35	8.91
National Old Age Pension Scheme (NOAP)	31.04	43.76	32.48	–
Widow/disable pension	24.94	29.37	26.16	–
Universal				
Rural education scholarship	32.66	–	44.73	24.47
In-kind transfer programmes				
Targeted				
Public distribution system (APL)	20.82	12.02	42.81	2.96
Public distribution system (BPL)	50.1	60.24	32.34	62.11
Public distribution system (PDS)	69.59	69.04	74.37	64.62
Antyodaya Anna Yojana (AAY)	4.61	7.94	4.16	–
Universal				
Integrated Child Development Services (ICDS)	64.88	77.54	51.64	50.47
National Mid-Day Meal Scheme	68.4	68	72.72	63.79
Free textbook	67.77	70.07	78.26	56.91
Free uniform	51.88	48.61	62.52	46.94
Workfare programmes (self-targeted)				
Sampoorna Grameen Rozgar Yojana (SGRY)	8.23	22.93	4.04	–
Food for work (FFW)	9.73	6.27	17.76	–
Subsidy-based livelihood programmes				
Targeted				
Swarnajayanti Gram Swarojgar Yojana (SGSY)	3.29	10	–	–

relationship with participation in many programmes. For example, the SCs have significant and positive coefficient for eight out of 13 programmes, viz, IAY, rural scholarship, AAY, MDM, free text, free uniform, SGRY and food for work programmes. In comparison with scheduled castes, the households belonging to scheduled tribes have probability of participation in only fewer (four) programmes.

(c) *Household size:* It has a significant and positive influence on household participation of seven programmes, viz, IAY, National Old Age Pension (NOAP), rural education scholarship, ICDS, MDM, free text and free uniform. Female-headed households do not show significant relationship for most of the programmes. Similarly, with few exceptions, occupation groups do not seem to significantly influence the participation.

(d) *Percentage of literates:* The percentage of literates in the household is positively related to four education-related programmes and negatively with seven poverty-centred programmes. These results are in the expected direction.

(e) *Size of landholding:* It has a negative relationship for four programmes (NOAP, PDS under BPL, free uniforms and food for work). In other programmes, land variable is not significant.

(f) *Covariate risks and idiosyncratic risks*: In case of IAY, ICDS and MDM the covariate risk is positively associated with the participation in the programmes, whereas in the case of SGRY, it is negatively associated. Idiosyncratic risk is significant in case of only three programmes, rural education scholarships, free uniforms and SGSY. However, it is negatively associated with free uniforms and SGSY. It is worth stressing that the relationship between risks and programme participations can be better explained only with panel data, which is beyond the scope of this study.

(g) *Village infrastructure:* It does not have much influence on the households participation in many safety programmes. Social infrastructure has a positive influence on participation in two programmes while economic infrastructure has negative coefficient in only one programme. It is interesting that economic infrastructure does not influence programme participation generally.

(h) *PRIs:* It is also interesting to note the functioning of PRIs also do not positively influence on the participation in safety net programmes. In fact, it has a negative (counter-intuitive?) relationship on participation in three programmes, viz, widow pensions, rural scholarships and the AAY.

(i) *Social capital*: One interesting finding is that social capital has a positively significant relationship with participation in nine out of 13 programmes. This is an important finding of this study. It shows that household's networking ability goes a long way in promoting the household participation in safety net programmes.

Accessing programmes: One of the factors often mentioned in the literature on anti-poverty programmes is that the poor often take the help of various functionaries to access programmes including such things as obtaining a BPL card. Ideally, the poor should be able to gain access to BPL cards and other programmes without anybody's help, but typically that did not appear to be case in villages we surveyed. So we collected the village-level information on the role of middlemen (or other "contacts") in accessing the programmes, and computed a village-level index, and used various village-level factors to assess what factors influence the dependence of poor households on middlemen to access programmes. Results are reported in Table 7.

Female literacy and women's general status in the household and households "trust" in public institutions significantly reduce the dependence on middlemen. The dependence on middlemen is higher in the relatively poorer state of Orissa than in the other two states.

Table 6: Significance Levels of the Variables in 13 Safety Net Programmes

Variables	Dependent Variables											
	IAY	NOAP	Widows' Pensions	Rural Edu Scholarships	PDS (BPL)	AAY	ICDS	Mid-day Meals	Free Uniforms	SGRY	FFW	SGSY
Wealth index (Ref: 4th quartile)												
1st quartile	0.603	-0.914	1.056 *	-0.989 *	0.310	0.637	0.554	0.888 **	0.127	-0.179	-0.595	-0.133
2nd quartile	0.366	-0.802	1.217 **	-0.663	0.174	0.875	-0.097	0.484 *	0.120	0.458	-0.559	0.232
3rd quartile	0.606 *	-0.996 *	0.373	-0.492	0.462 **	0.993	-0.517	0.399 *	0.340	0.222	-0.289	0.052
Social group (Ref: others)												
SC	0.687 *	-0.599	-2.237 **	1.099 **	0.130	1.663	0.456	0.629 **	1.253 **	1.146 **	1.331 *	-1.098 *
ST	0.491	-0.825	-0.976 *	0.485	0.260	1.965 *	0.063	0.286	1.322 **	1.288 **	1.913 **	-0.700
OBC	-0.053	-0.366	0.082	-0.364	-0.204	1.779 *	0.632	0.410	-0.128	1.380 **	1.137 *	-0.291
Household size	0.109 **	0.231 **	-0.017	0.339 **	0.028	0.008	0.444 **	0.513 **	0.214 **	0.050	0.114 *	-0.034
Sex of HoHH (Ref: male)												
Female	0.575 *	0.417	2.763 **	1.602 **	0.285	0.858 *	-0.079	0.397	0.059	0.144	1.289 **	1.008 *
Percentage of literates in HH	-0.005 *	-0.033 **	-0.021 **	0.018 **	-0.003	-0.012 *	-0.021 **	0.014 **	0.020 **	-0.013 **	-0.010 **	-0.006
Occupation of HoH (Ref: non-worker)												
Self-employed in agriculture	0.650	-1.033 **	0.162	0.126	-0.016	-0.846	-0.169	0.152	-1.186	0.861	2.529 **	0.605
Agricultural labour	0.522	-1.418 **	-0.372	1.318	0.261	0.588	0.183	0.177	-0.941	0.741	2.445 **	-0.582
Self-employed in non-agriculture	0.923 *	-1.667 **	1.517 **	-0.536	0.075	0.318	0.551	-0.096	-1.060	0.438	1.592	0.099
Non-agriculture labour	0.376	-2.299 **	0.138	1.055	0.182	0.041	-0.222	0.017	-1.174	1.108 *	1.457	-0.627
Others	-0.318	-1.353	-0.224	-1.472	-0.349	-17.962	-0.689	-1.025 **	-1.814 **	0.376	0.720	-1.009
HH experiencing any idiosyncratic risks (Ref: none)	-0.173	-0.267	0.493	0.641 **	0.186	0.231	-0.143	0.098	-1.076 **	-0.391	0.024	-0.958 **
HH experiencing any covariate risks (Ref: none)	0.327 *	-0.268	0.263	-0.015	-0.191	0.308	0.727 **	0.298 *	-0.067	-0.436 *	-0.463	0.300
Age of HoHH	-0.007	**	-0.008	-0.031 **	0.013 **	0.022 *	-0.018 *	-0.031 **	-0.008	-0.001	0.004	-0.008
Land possessed	-0.052	-0.147 *	0.004	-0.005	-0.027	0.006	0.003	0.017	-0.060 *	-0.025	-0.118 *	0.023
Social infrastructure	-0.208	-0.226	3.991 **	1.120	0.228	0.123	-0.751	0.160	0.884	3.452 **	2.984 **	-5.475 **
Economic infrastructure	0.668	1.340	0.950	0.130	0.362	-1.235	-0.429	-0.404	0.540	-1.425	-1.457	1.147
Functioning of PRIs	0.890	-0.415	-2.468 **	-1.810 **	0.374	-2.570 **	-0.171	0.464	0.424	0.865	0.982	-0.379
Household structural social capital	0.807 **	0.036	0.494	0.692 *	0.676 **	0.254	0.293	0.687 **	0.435	0.833 **	0.738 **	1.712 **
Women autonomy and decision-making score	-0.145	0.099	-0.128	1.593 **	-0.193	-0.071	1.004 *	0.240	0.090	-0.656	-0.285	-0.121
Women participation in meetings and elections	0.161	1.095	-1.213	0.251	0.350	0.826	1.116	1.502 **	-1.123	2.693 **	0.695	0.049
Average wage in village										0.004	-0.020 *	0.031 **
State (Ref: Karnataka)												
Orissa	0.387	1.341 **	-0.384	-2.066 **	-0.357 **	0.704	1.755 **	0.562 **	0.125	2.468 **	0.334	4.598 **
Madhya Pradesh	-0.058	1.210 *	-1.028 *	1.164 **	-1.619 **	1.376 **	0.718	0.432 *	0.824 *	0.462	1.410 **	1.547
Constant	-4.363 **	-0.476	-1.792	-3.667 **	-0.728	-5.371 **	-2.583 **	-4.407 **	-1.883	-7.329 **	-6.734 **	-6.003 **

Notes: * Significant at 1 per cent level.
** Significant at 5 per cent level.

IV
Pro-Poor, Pro-Rich or Pro-All? Targeting and Benefit Incidence

By their very definition, the anti-poverty programmes are supposed to be targeted to poor households, ie, the households below the poverty line. We have divided all households into four quartiles in terms of the asset/wealth index. In order to gain insights into targeting efficiency, we look at the distribution of beneficiary households by quartiles. This is shown in Table 8. One would expect the beneficiary households to belong to the poorest quartile or the bottom two quartiles. We see a different picture. For IAY, widows pension, AAY, SGRY, FFW and rural education scholarship, the bottom *three* quartiles account for the bulk of participants. The beneficiaries are about equally distributed across all quartiles for PDS, ICDS, MDM, free uniforms and free textbooks. A high proportion of beneficiaries of credit-based micro finance programme (SGSY) belong to the richest quartile. It is clear that with few exceptions, most anti-poverty programmes are reaching the poorest quartile as well as not-so-poor quartiles – thus confirming the widely acknowledged fact of poor targeting.

The distribution of beneficiary households by quartiles does not inform us about the actual benefits (kilos of grain, for example). We have tried to quantify the benefits and estimated distributive shares across quartiles for major safety net programmes. The results are discussed below.

Public distribution system (PDS): The PDS benefits targeted to BPL families are supposed to go to the lowest two quartiles (particularly to the bottom quartile). Table 9 shows that the lowest quartile for all states gets around 30 per cent for rice and wheat and 36 per cent and 40 per cent for sugar and kerosene, respectively. The second quartile also gets more than 25 per cent for all the commodities. However, the share of the third quartile is high for wheat at 30 per cent and 25 per cent for rice. The richest quartile also gets 17 per cent for rice and less than 15 per cent for other commodities. The results can be interpreted in two ways. The programme is reasonably targeted to the poor as their share is higher than the top two quartiles. However, there is substantial leakage of benefits to the non-poor.

Statewise details show that the programme effectiveness, in terms of higher quantity of benefits reaching the poor, in Orissa and Madhya Pradesh is far better than Karnataka (Table 9). In Karnataka, the second and third quartiles receive most of the benefits; even the fourth quartile receives substantial benefits. By contrast, in Madhya Pradesh the benefits accruing to richest quartile are negligible for all commodities.

Antyodaya Anna Yojana: As one would expect, this programme

Table 7: Factors Determining the Contacts with Middle Men

Dependent Variable: Contacting Middle Man (All Programmes)
Coefficients(a)

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig
	Beta	Std Error	Beta		
1 (Constant)	-0.122	0.132		-0.925	0.369
PRI functioning index	-0.048	0.033	-0.255	-1.483	0.158
Social infrastructure	0.002	0.050	0.006	0.030	0.976
Economic infrastructure	0.027	0.039	0.124	0.696	0.497
HH structural social capital	0.091	0.076	0.743	1.190	0.251
Trust PRI	-0.030	0.068	-0.131	-0.445	0.662
Trust officials	-0.064	0.107	-0.187	-0.597	0.559
Trust groups	0.129	0.046	0.540	2.796	0.013
Total female participation (elec, meet, etc)	0.047	0.079	0.129	0.596	0.559
Empowerment	0.126	0.101	0.286	1.247	0.230
Control on assets	-0.377	0.247	-0.275	-1.524	0.147
Average index	0.000	0.000	0.083	0.295	0.772
Ratio of female and male literacy	0.133	0.084	0.769	2.183	0.044
Percentage of female literacy	-0.244	0.103	-1.048	-2.371	0.031
Migrated	0.000	0.001	-0.139	-0.884	0.390
Presence of NGO in village	0.006	0.021	0.050	0.274	0.788
Social composition of village (Herfindal)	-0.037	0.034	-0.181	-1.077	0.298
Percentage of landless	0.130	0.104	0.569	1.249	0.230
Percentage of small farmers	0.113	0.078	0.519	1.455	0.165
Percentage of HH with at least one educated	0.067	0.047	0.326	1.444	0.168
Orissa dummy	0.296	0.084	3.766	3.541	0.003
Madhya Pradesh dummy	-0.019	0.071	-0.240	-0.270	0.791
Orissa – social capital	-0.117	0.099	-0.587	-1.184	0.254
MP – social capital	-0.064	0.083	-0.651	-0.777	0.448
Orissa – women's autonomy and decision-making	-0.586	0.209	-2.319	-2.803	0.013
MP – women's autonomy and decision-making	-0.090	0.150	-0.375	-0.597	0.559
Orissa – PRI functioning	-0.105	0.080	-0.745	-1.323	0.205
MP – PRI functioning	0.113	0.062	1.075	1.828	0.086

Table 8: Distribution of Participants by Quartiles: All States
(Per cent)

	Quartiles				
	1	2	3	4	Total
Cash transfer programmes					
Targeted					
Indira Awas Yojana	33.61	26.03	29.08	11.27	100
National Old Age Pension Scheme	29.01	27.6	13.63	29.76	100
Widow/disable pension	37.01	34.43	18.25	10.31	100
Universal					
Rural education scholarship	33.05	23.38	25	18.57	100
In-kind transfer programmes					
Targeted					
Public distribution system (BPL)	31.49	24.71	25.78	18.02	100
Antyodaya Anna Yojana	38.1	29.08	26.4	6.43	100
Universal					
Integrated Child Development Services	25.41	22.06	26.2	26.33	100
National Mid-Day Meal Scheme	27.94	24.16	26.29	21.62	100
Free textbook	28.83	23.12	26.98	21.07	100
Free uniform	29.54	24	26.62	19.84	100
Workfare programmes (self-targeted)					
Sampoorna Grameen Rozgar Yojana	29.1	31.81	23.8	15.29	100
Food for work	42.14	26.74	19.02	12.09	100
Subsidy-based livelihood programmes					
Targeted					
Swarnajayanti Gram Swarojgar Yojana	21.93	24.26	21.92	31.89	100

fares better in terms of benefit incidence (Table 10). The lowest quartile for all states gets around 36 per cent to 44 per cent of the total. In the case of wheat, second and third quartiles get higher than the first quartile. The share of top quartile was less than 5 per cent for all commodities except rice. At the state level, the performance is the best in Karnataka followed by Orissa. In Orissa, all commodities except kerosene are well-targeted to the bottom two quartiles. In Madhya Pradesh, the third quartile also gets substantial benefits from all commodities.

SGRY: Since wage employment may be expected to be self-targeted, the bottom two quartiles should participate disproportionately in the programme. We disaggregated the information also by gender (Table 11). The wage employment generated by SGRY for all states shows that the benefits are going more to the second quartile as compared to the first quartile. More than 80 per cent of the males in SGRY belonged to the second quartile. Interestingly, the targeting seems to be more effective for females than for males. Around 59 per cent of the females working in SGRY belong to the lowest quartile. Among the seasons, works during rabi and summer seem to be more pro-poor for females as seen by the higher share of lowest quartile. In the case of males, the share of the second quartile dominates in all the seasons. Clearly the programme is not attracting the richer quartiles, thus confirming some degree of self-selection.

Food for work: The employment generated under food for work seems to be even more pro-poor than SGRY. The lowest quartile has a share of 43 per cent in the total employment generated under food for work (Table 12). In all the seasons, the share of the lowest quartile is the highest. Particularly, the share of the first quartile in summer season (when unemployment rates are high and the opportunity cost of labour is low), FFW employment is 68 per cent. About the benefits to males and females, the results are similar to those of SGRY. However, we have a counter-intuitive result: 28 per cent of the employment is generated by the households belonging to the rich quartile. The reasons for participation by the rich are not known.

V
Findings from Qualitative Analysis

To supplement the quantitative analysis, we conducted focus group discussions and also collected brief family histories of selected poor households who either attempted but failed or actually participated and benefited from safety net programmes. Ideally, a qualitative analysis should throw light on those aspects in which the quantitative analysis is either inadequate or throws some puzzles. For example, we found that in two important dimensions, awareness of programmes and the pathways in which households access programmes, the contribution of PRI institutions has been minimal except in Karnataka. In order to unpack some of these puzzles, we organised focus group discussions across the different stakeholders that included the target communities, lower level bureaucracy, NGOs and political leaders.

The respondents from the communities across the three states generally agreed that the functioning of safety net programmes depended a great deal on the institutions implementing the programmes including the local governing bodies (PRIs), elected representatives and grassroot level bureaucracy, and the relevant institutions/agencies channelling the funds, as well as "activeness" of target communities themselves. The latter depended on households' literacy levels, cohesiveness among women, and the extent of caste, religious and class discrimination practices prevalent in the communities.

An important factor noted by respondents is the role caste and religion plays in the functioning of local governing bodies including PRIs. Significant discrimination against SC/ST and minorities is noted as one pervasive feature of local bodies. For example, there is hardly any representation of tribals in local bodies. The awareness levels of tribal households are very low in all the states. In some villages, the failure to access major safety net programmes is evident among minorities. The village-level institutions functioned poorly due to bureaucratic interference in Madhya Pradesh relative to Orissa and Karnataka. In particular, interventions by politicians in conjunction with caste-based discriminations led to poor governance of

Table 9: Percentage Distribution Quantities of Important Commodities Purchased in PDS (BPL) by Quartiles

State/Quartiles	Commodity			
	Rice	Wheat	Kerosene	Sugar
Orissa				
Q1	29.31	31.98	39.73	32.76
Q2	24.02	17.27	19.40	24.69
Q3	25.49	31.01	22.18	22.05
Q4	21.18	19.73	18.69	20.49
All	100.00	100.00	100.00	100.00
Madhya Pradesh				
Q1	47.44	36.87	56.43	48.75
Q2	27.61	23.32	24.84	26.00
Q3	20.27	31.21	13.90	16.57
Q4	4.68	8.60	4.83	8.68
All	100.00	100.00	100.00	100.00
Karnataka				
Q1	25.98	24.13	24.95	24.44
Q2	29.87	28.35	31.41	30.20
Q3	25.33	27.14	26.14	26.77
Q4	18.81	20.38	17.50	18.60
All	100.00	100.00	100.00	100.00
All States				
Q1	30.25	31.92	40.05	36.28
Q2	27.81	25.10	26.36	27.64
Q3	24.60	29.66	20.65	21.65
Q4	17.33	13.32	12.94	14.43
All	100.00	100.00	100.00	100.00

Table 10: Percentage Distribution (Quantities) of Important Commodities Purchased in PDS (AAY) by Quartiles

State/Quartiles	Commodity			
	Rice	Wheat	Kerosene	Sugar
Orissa				
Q1	43.78	3.04	21.90	31.92
Q2	16.44	95.10	16.90	48.62
Q3	21.70	0.00	52.68	0.00
Q4	18.07	1.85	8.52	19.46
All	100.00	100.00	100.00	100.00
Madhya Pradesh				
Q1	25.72	19.48	53.05	29.14
Q2	15.80	34.94	17.97	28.09
Q3	58.48	45.58	28.97	42.77
Q4	0.00	0.00	0.00	0.00
All	100.00	100.00	100.00	100.00
Karnataka				
Q1	50.31	53.11	38.24	53.70
Q2	40.58	37.14	53.59	38.95
Q3	0.00	0.00	0.00	0.00
Q4	9.12	9.75	8.17	7.35
All	100.00	100.00	100.00	100.00
All States				
Q1	41.98	22.71	44.00	36.18
Q2	23.02	40.09	25.56	32.89
Q3	23.03	35.74	27.06	27.19
Q4	11.96	1.47	3.38	3.74
All	100.00	100.00	100.00	100.00

54

local bodies. Representatives of NGOs were of the view that political interference and bureaucratic hassles are the main hindrances for the effective implementation of programmes. Between Orissa and Karnataka states, focus group discussions revealed that in Karnataka, largely due to better functioning of PRI institutions and the grassroot level bureaucracy, targeted communities manage to access programmes better than in other states. However, the respondents from the sample communities of Karnataka have reported that the PRIs and the bureaucracy have neglected the poorest of the poor in providing access to the safety-net programmes. This perhaps explains the lack of relationships of PRI functioning and access to programmes that are targeted to the poorest of the poor (such as IAY).

One important finding that emerged from focus group discussions is that better functioning of PRIs can lead to functioning of the grassroot level bureaucracy – as is the case in Karnataka. Respondents from bureaucracy across the states also have expressed this perspective. The relatively better status of decentralisation was evident from better empowerment of PRIs in Karnataka as compared to Orissa and Madhya Pradesh. From what one gathers from respondents in Madhya Pradesh is that the mere fact of decentralisation to empower the PRIs may not work in favour of vulnerable communities given the pervasive social discrimination practised.

The respondents have also reflected on the role of alternative institutions, viz, NGOs and women's self-help groups in implementing the safety net programmes. The respondents from Karnataka state are not totally in favour of NGOs. They have preferred PRIs to NGOs. This indicates the trust of the targeted communities in PRIs. Moreover, this also indicates that the NGOs are crowded out if the PRI institutions function well. The NGOs are preferred in Orissa and Madhya Pradesh. Women's self-help groups are preferred as alternatives to improve the implementation process of safety net programmes in all the states, by and large.

VI
Conclusions

This study is based on household-level and village-level surveys on the profile of household risks and the functioning of safety net (anti-poverty) programmes in the states of Orissa, Madhya Pradesh and Karnataka. The survey instrument itself is concise and does not include a consumption module. In all 13 programmes covered in the study, which fall into four broad categories, viz, cash transfer, in-kind transfer, work fare and subsidy-based livelihood programme. The conclusions are summarised as follows:

(1) The evidence in three states reveals that sudden health risk dominates all idiosyncratic risks. Risk patterns vary by states, quartiles and social classes. The proportion of households that experience a health risk is much higher among the poorest quartile than for other quartiles, higher among scheduled castes and tribes than among other castes, and higher in Orissa than in other states. Weather-induced covariate shocks are present in all states and among quartiles, but the incidence is varied. The proportion of households affected is larger in Karnataka (which has a large percentage of dry land) than in other states. In general, a larger proportion of households in the upper two quartiles experienced weather risks, whereas a larger proportion of households in the poorest two quartiles experienced sudden health risks. The risk of livestock epidemic is largest in Orissa.

(2) Awareness is high for some of the in-kind transfer programmes like PDS and mid-day meals and cash transfer programmes like IAY and pension schemes as compared to workfare and subsidy-based livelihood programme. The PDS has the highest awareness, followed by mid-day meal and IAY. Differences in awareness across quartiles are small for most programmes. However, differences in awareness across social groups are significant for a few programmes. In particular, a significantly lower proportion of tribal households is aware of three critical programmes which include, surprisingly PDS, and also education-related safety net programmes. Awareness of programmes is better in Orissa than in other states. At the village level, factors such as status of women in the household, presence of NGO in the village, and high (overall) level of education in the village have contributed positively and significantly to creating awareness of safety net programmes in sample villages. As compared to Karnataka, the PRIs in the other two states are not playing an important role in creating awareness of programmes. An interesting finding is that

Table 11: Distribution of Wage Employment Generated by SGRY by Quartiles

	All States				
	Q1	Q2	Q3	Q4	Total
Head of household					
Kharif	27.76	51.36	10.37	10.51	100.00
Rabi	33.54	46.93	10.87	8.66	100.00
Summer	4.95	29.52	61.53	4.00	100.00
All	17.27	39.23	36.72	6.78	100.00
Adult male					
Kharif	10.47	84.03	0.00	5.50	100.00
Rabi	20.01	56.26	6.34	17.40	100.00
Summer	0.00	86.45	6.02	7.52	100.00
All	4.90	81.52	4.96	8.62	100.00
Adult female					
Kharif	23.44	48.51	17.54	10.52	100.00
Rabi	48.96	27.67	9.14	14.24	100.00
Summer	70.05	9.66	9.62	10.67	100.00
All	58.78	19.13	10.79	11.30	100.00
All members					
Kharif	23.96	56.83	9.61	9.60	100.00
Rabi	34.49	44.40	9.69	11.41	100.00
Summer	20.26	39.23	33.89	6.63	100.00
All	23.81	44.26	23.72	8.21	100.00

Table 12: Distribution of Employment Generated by Food for Work by Quartiles

	All states				
	1	2	3	4	Total
Head of household					
Kharif	48.30	23.58	14.58	13.53	100.00
Rabi	54.14	1.22	16.52	28.13	100.00
Summer	62.03	9.78	11.88	16.31	100.00
All	50.83	19.43	14.39	15.35	100.00
Adult male					
Kharif	13.92	43.77	12.74	29.57	100.00
Rabi	0.00	24.96	75.04	0.00	100.00
Summer	15.94	52.17	15.94	15.94	100.00
All	13.64	43.63	14.52	28.22	100.00
Adult female					
Kharif	27.00	37.32	21.60	14.07	100.00
Rabi	30.61	0.00	16.33	53.06	100.00
Summer	77.50	13.97	3.28	5.24	100.00
All	51.34	24.24	12.57	11.86	100.00
All members					
Kharif	36.37	30.76	15.09	17.77	100.00
Rabi	46.53	2.77	20.79	29.90	100.00
Summer	68.32	13.87	7.45	10.36	100.00
All	43.35	25.42	14.02	17.21	100.00

55

awareness of safety net programmes is low in wealthier villages; presumably the demand for safety net programmes is high in relatively poorer villages.

(3) There is much variation in the participation rates across programmes, quartile groups and as among states. Across programmes, more than 60 per cent of households are aware of in-kind programmes like PDS, ICDS, mid-day meal and free textbooks. Participation rate is less than 10 per cent for programmes like AAY, SGRY, food for work and SGSY. Across states, participation rates for all households are higher in eight out of 13 programmes in Orissa, six out of 13 programmes in Madhya Pradesh. Across quartile groups, the participation rate for PDS is above 70 per cent in all the four quartiles. Participation rates are higher for the lowest quartile in nine out of 13 as compared to the top two quartiles. Relatively high participation rates for the top two quartiles in PDS, ICDS, mid-day meal, free textbook, free uniform, SGRY, etc, indicate that substantial sections of non-poor are participating in these programmes. In Orissa, the proportion of tribal households participating in the programmes is lowest.

(4) Among the factors determining participation of households in various programmes, the coefficient of social capital is positive and statistically significant in nine out of 13 programmes. It indicates that households use their networking ability to gain entry into safety net programmes. Another interesting finding is that the literacy in the household influences positively in the households' participation in all child-related and education-related programmes and negatively related to participation in the workfare programmes. Women's empowerment is also significant in child-related safety net programmes. In most programmes, functioning of PRI institutions and village level infrastructure are not statistically significant except in Karnataka. In half of the programmes, the probability of participation is higher in Orissa than in Madhya Pradesh and Karnataka.

(5) Targeting in terms of distribution of beneficiaries by quartiles shows that the beneficiaries are about equally distributed across all quartiles for PDS, ICDS, mid-day meals, free uniforms and free textbooks. A high proportion of beneficiaries of credit-based micro finance programme (SGSY) belongs to the richest quartile. We see a different picture for IAP, widows' pension, AAY, SGRY, FFW and rural education scholarship. In these programmes, the bottom *three* quartiles account for the bulk of participants.

(6) Data constraints limited the analysis of benefit incidence to only four programmes: PDS, AAY, SGRY and FFW. The analysis shows that the poor benefits disproportionately from AAY, SGRY and FFW in which the share of the richer quartiles is lowest. In PDS, however, the share of the poorest quartile is only slightly higher than 25 per cent whereas the shares of richer two quartiles are not insubstantial. Households in the third quartile, and even in the fourth quartile, seem to benefit substantially in all four commodities (rice, wheat, kerosene and sugar) from PDS. Such leakage of benefits of PDS to the upper two quartiles is highest in Orissa and Karnataka, but lowest in Madhya Pradesh. On the other hand, the distributive shares of benefits from the two wage employment programmes seem to favour the bottom two quartiles and women among them disproportionately, reflecting some degree of self-selection.

(7) Taken together, the results generally confirm the poor targeting outcomes of the oldest anti-poverty programme (PDS) that accounts for the bulk of expenditure on safety nets in India. In general, the newly introduced cash-based, low budget programmes and workfare programmes seem to be better in terms of targeting outcomes reaching the poorest quartiles disproportionately, than the largest food-based and expensive programmes like the PDS.

(8) The qualitative analysis strongly complements the findings from the quantitative analysis. In particular, it reveals the role of caste discrimination in gaining access to programmes. In both Orissa and Madhya Pradesh, caste discrimination seems to be a major factor lowering the participation rates. Households of disadvantaged social classes do not seem to have much faith in the functioning of PRI institutions in Orissa and Madhya Pradesh. Particularly discriminated are tribal households who simply do not seem to avail of PRI institutions to air their grievances. It also explains why poor households in all three states seem to be using their networking ability to gain access to programmes. The qualitative analysis also shows that in places where caste discrimination is pervasive in PRI functioning, poor households seem to use NGOs and SHGs to access and benefit from programmes. Where PRIs are doing reasonably well, as in Karnataka, poor households do not seem to favour NGOs.

Some Policy Implications

The study points to one gaping hole in the safety net policy/programme framework. The prevailing safety net programmes do not seem to address the most dominant and pervasive risk of poor households, viz, exposure to serious health risk. Considering that the poor resort to coping strategies of borrowing and working extended hours by women (and possibly also children), episodes of serious illness in the household are the most likely cause of perpetual indebtedness and possibly also to poverty trap situations.

Communitywide weather-induced risks (drought, cyclone and/or flood) are also experienced by households in all quartiles, but their direct incidence is highest among households in the relatively richer quartiles who happen to own land. Unlike in the case of health risks, there are workfare programmes (SGRY, FFW) in place to provide consumption-smoothing in the wake of such weather-induced risks. However, participation rates in these programmes is low – either because of inappropriate timing of programmes or due to sporadic or untimely release of funds for these programmes.

The risks that are best covered by programmes are those relating to household food security. PDS, MDM, and ICDS are all reaching a large proportion of poor households. But the problem is: they are also reaching a high proportion of households in the upper two quartiles – an immediate result of weak targeting enforced by BPL lists.

Homelessness is a risk that attracted policy attention several years ago when the programme of housing subsidy (IAY) was launched. But gaining "entry" into the programme would require households to possess enough "social capital", ie, networking ability. Not surprisingly, the programme (which has a very large cash transfer) is attracting households in the upper quartiles. Qualitative analysis had shown substantive abuses and corruption in the actual implementation of this programme.

Recent programmes have begun to cover other risks, viz, the risk of old age poverty, poverty among widows and the risk of children dropping out school. The two pension programmes – NOAP and widows' pensions – seem to be reaching poor households, especially widows' pension is strongly correlated with participation by widows from the poorest quartiles. The education programmes (free uniforms, textbooks, etc) on the other hand, show mixed results. These programmes seem to work well in Madhya Pradesh, but not in the other two states. The fact that the presence of educated individuals in the household is an important factor promoting children's participation. It suggests that children belonging to parents with no education, especially belonging to scheduled tribes, have not been able to take advantage of this safety net. On the positive side, women's empowerment seems to strongly influence participation in child-related safety nets. To the extent women are empowered by programmes such as self-help groups, children of deprived communities should be able to take advantage of these programmes.

The study has provided some important insights into the functioning of institutions and social capital. Karnataka clearly stands apart from the other two states in the functioning of PRI institutions, and their positive role in promoting awareness and participation of the poor. Where caste discrimination is pervasive, households do not seem to trust PRI institutions. Instead, they seem to rely on their social capital and caste networks to gain entry into programmes (and even in obtaining BPL cards). As the stranglehold of caste is eased over time, the PRI institutions may be expected to do better in reaching out to the poor.

Looking into the future, immediate policy initiatives need to focus on improving the productivity of existing programmes by encouraging PRI institutions at the village level to promote awareness of programmes among poor households and especially correct the observed serious exclusion errors (as evidenced by low participation of households belonging to scheduled tribes). At the same time the outreach of programmes to the poor have to be tightened via improvements in approaches to targeting (so as to avoid inclusion errors), launch new programmes to cover uncovered risks (especially health risks). Most importantly the PRI institutions should be made accountable for better functioning of safety net programmes with possible external oversight; and work towards synergy between programmes and policies launched by the centre and states so as to avoid duplication of efforts. EPW

Email: profmahendra@gmail.com

[For comments and suggestions on earlier drafts, we are grateful to the participants of a seminar at CESS and to Philip O'Keefe, Mansoora Rashid and Puja Dutta. The views expressed herein are those of the authors and do not necessarily reflect the opinions or policies of the organisations to which they belong.]

References

GoI (2006): 'Towards a Faster and More Inclusive Growth: An Approach to the 11th Five-Year Plan', Planning Commission, Government of India, June 14.

Ravallion, M (2003): 'The Debate on Globalisation, Poverty and Inequality: Why Measurement Matters', World Bank Policy Research Working Paper 3038.

Subbarao, K (2003): 'Systematic Shocks and Social Protection: The Role and Effectiveness of Public Works Programme', Social Protection Discussion Paper No 0302, World Bank, Washington DC.

Subbarao, K et al (1997): 'Safety Net Programmes and Poverty Reduction: Lessons from Cross-Country Experience', World Bank, Washington DC.

World Development Report (2006): 'Equity and Development', published for the World Bank, Oxford University Press.

Centre for Economic and Social Studies

Nizamiah Observatory Campus, Begumpet
Hyderabad – 500 016 Website: www.cess.ac.in

Award of Institutional Doctoral Fellowships

The Centre for Economic and Social Studies, Hyderabad is administering the following three fellowships (in two categories) under the Institutional Doctoral Fellowships Scheme of the Indian Council of Social Science Research for the year 2007-08. These fellowships are in the disciplines of Commerce, Development Statistics, Economics, Geography, Political Science, Public Administration, and Sociology. Those who are selected for the fellowships will have to register for their Ph.D within six months under one of the faculty members of the Institute.

Category – 1: Ordinary Student Fellowships: Two Fellowships are available under this category. Am amount of Rs. 6000/- per month will be paid for a period of two years. In exceptional cases, it may be extended to the third year. In addition to the monthly fellowship, a contingency grant of Rs. 12000/- per annum will also be paid. Applicants should have a PG degree from a recognised university in the above subjects with at least 55 per cent marks. In addition, they should have any one of the following: (a) Passed the National Eligibility Test, (b) Completed an M.Phil Degree, (c) Published two research articles in reputed journal (Reprints must be enclosed). Scholars without NET will be eligible for the scholarship amount of Rs. 5000/- per month.

Category – 2: Salary Protected Fellowship: One Fellowship is available under this category. A person who is employed in the teaching and research institutes is eligible for this category of fellowship and his/her entire salary will be protected. In addition, a contingency grant of Rs. 12000/- per annum will also be paid. The duration of the salary-protected fellowship will, in no case, be more than two years.

Age: The upper age limit is below 35 years as on 31 July 2007 (relaxable by 5 years in case of SC/ST). For teachers and professional staff of research institutes holding regular posts (for salary-protected fellowship), the upper age limit would be 40 years. In exceptional cases, the age limit may be relaxed marginally at the discretion of the selection committee. Reservation for SC & ST will be followed as per the UGC guidelines.

Interested candidates can download the application from the ICSSR website www.icssr.org and the completed applications should be sent to the following address on or before 14th September 2007.

The Programme Coordinator
Centre for Economic and Social Studies
Nizamiah Observatory Campus, Begumpet
Hyderabad – 500 016
Email: research@cess.ac.in

Institutionalising Common Pool Resources Management

Case Studies of Pastureland Management

Pasture development interventions under various schemes of advancement of common pool resources have given mixed results in Rajasthan. Facilitating agencies must be aware of the local dynamics and conflicting interests and should promote village institutions keeping in view local factions and their inclinations. It is not the formally registered or constitutionally acknowledged body, but the underlying structures that make CPR management systems successful while rendering some others unsuccessful.

Pradeep Kumar Mishra, Mukul Kumar

In Rajasthan, commonland contributes significantly to the livelihoods of rural people. Jodha observes that in the dry regions of India (including Rajasthan), rural poor are heavily dependent on common pool resources (CPRs) which supply most of their fuel and grazing. It is also an important source of employment and income for the poor, especially in periods when other opportunities are not available [Jodha 1986]. Further, a large population in Rajasthan depends on animal husbandry, which contributes 19 per cent to the state domestic product [UNDP 2001], underlining the importance of village commonlands which provide a major source of fodder.

The availability of commonland is also high in the state, about 1.64 million ha. Over a period of time the commonland has degraded extensively; over 40 per cent commonland areas have become less poductive or unproductive due to excessive grazing, heavy soil erosion caused by felling of bushes and trees and complete neglect by the community [Hegde et al 2001]. To get over this problem of commonland degradation, silvi-pasture development activities have been undertaken widely under various government-sponsored rural development schemes.[1] Under these programmes, an area of 50-100 ha of commonland each has been developed in thousands of villages in the state.

Large investment in pastureland development does not mean that the intervention is well managed all the way. In a number of cases these pastures have depleted after the completion of the project (under which it was developed) period as the implementing agencies withdrew. Open grazing, felling of trees, damage in the boundary wall, stones of check dams being stolen were the common features found [Kumar and Mishra 2001]. These results have raised concerns among the stakeholders of the programme over the sustainability of created assets. However, failure does not characterise all the villages – there are silver linings as well. There have been examples of well-established management systems organised by people on their own.

These diverse observations take us to the age-old debate on CPR management. In this paper the attempt has been to discover the factors that have led to the success/failure of the CPR management system. As part of this study, six villages in Rajsamand district were studied. The process of the establishment of the management system – how the CPR development works started; how the problems were dealt with; and what led to the present situation – form the subject of analysis.

I
Theories of Collective Action and Commonland Development

Early theories related to CPR management are based on the premise that human beings are basically selfish and their ever increasing economic wants lead to the exploitation of commons. Hardin's work *Tragedy of Commons* says that people tend to overexploit commons in order to make individual gains [Hardin 1968]. Olson has tried to define the factors of interest groups and pressure groups leading to collective action. He challenged a generally held view that groups of individuals having common interests usually work together to achieve them, though he expressed his reservation on the applicability of his statement to a small group of individuals [Olson 1971]. The prisoners dilemma game highlights the fact that lack of communication leads all the parties to lose. These theories capture important aspects of CPR management, but they also do not exhaust all possibilities regarding solutions to management problems. At most, they can fit into specific situations particularly in extreme cases. In the context of an Indian village the flow of information among the users is very high, and these theories may not be able to adequately explain the situation. In fact, these theories can have dangerous implications when they become the basis for policy prescriptions [Ostrom 1990:6]. The domain of collective action is an evolving one and a certain degree of openness to empirical realities would help develop better policies. For that we would have to stop being prisoners of the overarching frameworks of collective action.

The recent works on CPR management have improved upon these theories. Elinor Ostrom, in her empirical work *Governing the Commons* (1990) has analysed the long-enduring, self-organised and self-governed CPRs. Recognising that communities may come forward to develop institutions that can provide a viable solution to the CPR related problem, she suggested a set of eight design principles for CPR management. Her framework helps in

58

Figure 1: Research Design

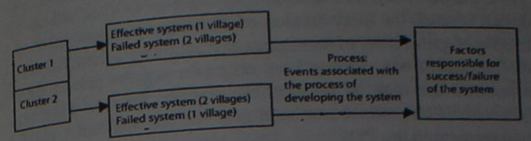
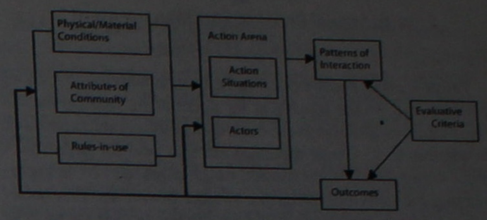


Figure 2: The IAD Framework for Institutional Analysis



Source: Ostrom 1999.

understanding a CPR management institution better. Wade (1988) in his work spelt out the conditions for organisation for the successful management of CPRs. The Oakerson's Model [Oakerson 1986] can be used to diagnose CPR problems. Adams et al (2002) provide a framework for policymakers. They say that resource managers with the power to make relevant decisions may be part of formal or informal institutions. Jodha's study, which covered 88 villages all over India attributes the success or failure to lack of neglect of institutional factors, a tendency to overemphasise technical factors and externally controlled interventions [Jodha 2001].

However, the problem of explaining the process of success and failure in establishing a CPR management system continues to be there and as a result we have a large number of failures even today. Ostrom mentions that using the earlier theories it is not easy to explain why some appropriators could maintain the collective institutions while others could not [Ostrom 1990: p 185]. Katar Singh (1994) observes that CPR management is a relatively nascent area of specialisation. As we have discussed earlier, commonland development is an important intervention in rural development programmes. As a matter of principle, these programmes are implemented with people's participation and this turns the task of CPR development into an institution building exercise. Chopra et al (1990: p 144) say that participatory models are difficult to establish. Hence, it becomes more important to understand the process of establishing people's institutions for effective utilisation of the large investment and sustainable management of the CPRs.

This paper tries to understand the process followed in the context of government-funded watershed management projects which were developed through the intervention of an external facilitating agency. Also, these are small sized CPRs (ranging from 50-250 ha approximately) and have been seven-eight years old at the time of the study (year 2001). Thus we cannot say that these are self-organised and long-enduring CPRs and hence Ostrom's design principles might not fit into it. The analysis in this paper would be more relevant in determining the factors for institutionalising the pasture management systems.

II
Study Area, Objectives and Methodology

The study area comes in Rajsamand district that lies in the southern part of Rajasthan across the Aravali mountain ranges. This part of the state is topographically undulating and mainly rainfed. It has faced several recurring droughts and has perennial water scarcity, the national watershed development project for rainfed areas (NWDPRA) was considered a boon for the region. In all, 67 villages were covered (during the first phase[2]) in this programme in the district of which pasture development was undertaken in 32 villages. A preliminary estimate showed that in about half of these 32 villages pastures were managed properly after the completion of the project period while in the other half they depleted. The department of watershed development and soil conservation (WD and SC) of the government of Rajasthan was the project implementing agency (PIA) for NWDPRA.

Preliminary discussions with PIA officials revealed that pastureland development works in Sangawas and Sundarcha villages (located in different clusters) were the most successful experiences and they were doing well even in the post-project phase. However, pastures developed in the neighbouring villages were found to have depleted. It was interesting to note that despite being situated in the vicinity of "successful" villages under the guidance of the same implementing agency there have been contrasting results. For a comparison of the process and results, two other villages where the pastures were not successful were selected in each cluster: Cluster 1: Sakroda-Sundarcha watershed (area treated: 3,864 ha), villages: Sakroda, Sundarcha, Dipti; Cluster 2: Kamli watershed (area treated: 3,524 ha), villages: Sangawas, Kundeli and Rashmi.

Figure 1 explains the research design. Before finalising the study villages, a visit to each of them was undertaken to determine the status of the pasture. Interestingly, when we visited the villages we found that the village Kundeli had an established system of pasture management and we termed it as a successful case, although the PIA, because of the low survival of plantations considered it a failure. By success we hereby mean "Controlled and sustainable use of treated pastures backed by appropriate institutional arrangements". There are two markers of success for this study and both have to be found in any "successful" initiative:

– Controlled and sustainable use of pasture
– Appropriate institutional arrangement

Data collection involved discussions with the villagers with the help of a checklist and interviews with key persons who were directly associated with the CPR management in the villages (members and main office bearers of the institutions). Discussions were also held with the PIA officials. To understand the location of villages vis-à-vis the users' settlement, resource mapping was used. The records of the PIA, including watershed maps of these villages were referred. The observations were recorded in the form of six case studies. The cases have been presented in descriptive form on the process of institution building over time. The factors causing success and failure were analysed using the institutional development framework (IAD framework) suggested by Ostrom (1999) which can be depicted in Figure 2

59

III
Withdrawal Process and Management System in Place

The process of pasture development starts with the PIA taking permission from the panchayat for undertaking work in the village pasture as the latter is the custodian of the common pastures. In addition to it, village meetings are also held for approval. A users' committee (UC) is formed which helps the PIA in implementing the activities. After the project is over the PIA hands over the pasture back and withdraws.[3] In this section the process of handing over the withdrawal of the PIA and associated events in each one of these villages have been described, along with a brief profile of each village.

Cluster 1: Sakroda-Sundarcha Macrowatershed

Village 1: Sundarcha

In this village an area of 50 ha of pastureland was developed.[4] The work started in 1994 and at that time the pasture was under open grazing. The pasture was almost barren except for the presence of some bushes and shrubs. There were around 400 households living in three hamlets – Gachalon ka Guda, Bhilon ki Bhagal and Sundarcha. Brahmin, rajput, meghval, bhil and gujar were the castes and tribes that inhabit the village. Brahmins and bhils comprised around two-thirds of the population. Among the rest of the population, gujars were in a majority. Around 40 per cent of brahmins have government jobs and were engaged in the organised sector. Thus the village was heterogeneous in terms of social composition. There were about 2,000 animals in the village mostly belonging to gujars and bhils, who depended on agriculture and animal husbandry. Their animals (mostly cattle and buffaloes) were of local breeds and they left their animals open for grazing. A few of the villagers especially brahmins had some cattle of improved breeds and they practised stall feeding.

At the time of study a pasture development committee (PDC) was looking after the management of the pasture. It had employed a 'chowkidar' (guard) for watching and warding the pasture. Before the harvesting season, the PDC auctioned the grass to the highest bidder who took care of harvesting activities. It had fixed a norm that the first priority would be given to the villagers of Sundarcha for selling grass. The price of grass for the villagers was fixed lower than the market rate. The auction was held in the presence of panchayat samiti officials. For two years, Rs 22,000 a year[5] had accrued to the committee, which was used for expenses on the salary of the chowkidar and maintenance of pastureland premises.

The main users of the pasture were gujars and bhils who lived in hamlets near the pasture and their animals grazed on this pastureland. As the pasture development work started in 1994, it was protected in consultation with the villagers. The closure of the pasture to grazing did not affect the people nearby significantly, as there was hardly any vegetation available there. Also, there was a good amount of private 'beed' (pastureland) available in the village. But over three years the protection of the pasture and allied activities like contour bunding in the area led to an increase in the production of grass in the area. With this, competing claims from various quarters were also received.

During the project period, the primary responsibility of the pasture's protection was with the PIA and the UC was not very worried about it. After the completion of the project period, in 1997, the department constituted a 22-member PDC of villagers drawn from all the three hamlets of the village and handed over to it the responsibility of management. According to the villagers, the panchayat was not too keen on protecting the pasture and supported the idea of opening the pasture for free grazing. Hence, the PIA preferred to hand over the responsibility of the management to the PDC.

Although the formal handover took place, the situation became bipolar. As the PDC discussed the means of benefit distribution, some people favoured open-grazing while others did not. This conflict of opinions represented the convenience of different livelihood patterns of groups of people in the village. Attempts for open-grazing were made mainly by the gujars. Bhils also were in favour of open-grazing but it was primarily the gujars who traditionally depend on animal husbandry. The pro-protection group, which was dominantly brahmin but supported by some others, opposed attempts of opening up the pasture. They were of the view that gujars had already encroached the commonland near their hamlet and hence this piece of land must be protected. Incidentally, these two groups were the main political groups operating in the political space of Sundarcha panchayat. The politics of the village developed such that the pasture became a ground for competing demands. Underlying the politics were the different livelihood patterns of the groups on both sides.

The group favouring the protection of pasture put its point strongly. In 1997 some of them, backed by the then sarpanch who was a gujar himself, took their cattle to the pasture. This caused serious conflict in the village and led to a showdown between the opposing groups. As the issue could not be resolved at the village level, the pro-protection group took the matter to the police and district administration. Finally it was resolved that the pasture would remain enclosed and would be looked after by the PDC. The PDC was reformed and the number of members was reduced to eight as it was felt that the large 22-member committee was unable to meet regularly. Though the committee represented all the hamlets of the village, due care was taken to leave out those who favoured open-grazing.

Given that the pasture remained protected, the gujars did not prefer the auction system. The sarpanch said it was not of much use except its environmental value. The gujars preferred the cut and carry method over the auction system as this would ensure a greater availability of grass to them. He mentioned that the cut and carry method would not suit the other group, who favoured the auction system. The PDC considered the auction system simple and least problematic as opposed to the cut and carry method. The secretary of the PDC said that they had tried it once and did not find it practical. In the first year after the PDC took charge, the grass of one patch was auctioned and secured Rs 2,500. On the other hand, the cut and carry method was followed in two other patches which secured Rs 2,200 only. The secretary mentioned that the cut and carry method would require closer and regular monitoring to ensure that no one gets more than what he has paid for. Moreover, the income from the grass would also come piecemeal.

At the time of this study, in 2001, the pasture was in good condition with a system of management in place. Free grazing was not allowed in the pasture and there was stone fencing around the pasture. The survival of trees in the pasture was also good. The secretary of the PDC and the chowkidar of the pasture handled routine matters related to the pasture. The chairman said

that PDC meeting was held only if some major decision was to be taken. He also added that the villagers left the responsibilities largely to the secretary and chowkidar as long as the pasture was maintained and harvested in a sustainable manner. He, however, presented an account of yearly income and expenditure before the PDC and the general assembly of the village. Thus, the CPR system in Sundarcha evolved gradually and finally assumed shape in response to the problems faced.

Village 2: Dipti

This was a small village with around 80 households. There were around 150 cattle and buffaloes and 200 goats in the village. Brahmins were the majority constituting about 60 households and the rest were Bhils. A number of people (about one-third) were in government service, and some were daily labourers as well.

Under the NWDPRA scheme an area of 40 ha of pastureland was developed in this village. The decision to enclose a portion of the pasture was made by the PIA in consultation with members of the users' committee. Before the PIA began work on this patch of land the village already had another patch of pasture developed by the forest department that was closer to the village settlement. The closure of this 40 ha however led to increased pressure on the pastureland developed by the forest department. This portion of land was also under open grazing since then and there was little vegetation on it. A stone-fencing around the pasture was erected during the project period and plantation undertaken.

The villagers had little memory of the project days. In 1995, the PIA handed over the pasture in the village to the panchayat. Within a year it was open for grazing. Neither the villagers nor the panchayat tried to establish any system for the protection of the pasture. No rule existed for the protection and maintenance of the pasture. Dipti was also under Sundarcha panchayat, whose sarpanch supported the idea of open-grazing.

Unlike Sundarcha and Sakroda, Dipti's farmers did not have private beeds. In such a scenario, it was all the more expected from the villagers that they would protect the pasture. This could not happen because there was no consensus in the village for this decision. Secondly, a majority of the villagers had the purchasing power to buy fodder (as many of them was in government service). Hence they did not care to protect the pasture. The protection and management of pasture could have helped bhils in the village but they also did not come forward to protect it. The villagers said that the PIA did not initiate the process of maintaining the pasture as it did in Sundarcha. The handover of the pasture at the end of the project was made by the PIA to the panchayat without consulting the villagers. The community also did not show any initiative in Dipti. As the village did not respond actively to watershed works during implementation it received less attention than Sundarcha. One reason for this lack of involvement of the people may be that till 1995, when the pasture was completed in Dipti, there was a single committee for five-six villages of the whole macro-watershed and Dipti had only a couple of members in the users committee.

At the time of the study, the pasture of the village was not well-maintained. The stone wall fencing was broken in many places and needed repair, and it was open for grazing. The survival rate of the plants in the pasture is also poor. There was no system for the management of pasture in place.

Village 3: Sakroda

There were around 500 households, 2,000 cows and buffaloes and 2,500 goats and sheep in this village. Almost all the animals were of local breeds. Hence the pressure on grazing was high – small animals could not be stall-fed. There were only a few people in Sakroda in government jobs. Many people worked in tertiary sectors like transport.

In this village two patches of land were developed (total 36 ha, one 17 ha, and the other 19 ha) in two phases. One was in good condition and was protected while the other was opened for free grazing. There was a third patch of pasture under treatment during this study in the same programme and that was also well protected. The decision to enclose the pasture for treatment was made by the PIA and the UC. The closure of the pasture did not seriously affect villagers as the enclosed portion of land constituted only a small portion of available pasture (both panchayat and private) in the village.

Brahmin, gujar, bhil, rajput, and khatik are the main castes and tribes which inhabit the village. Agriculture and animal husbandry are the main occupation of the villagers. Sakroda is a big multi-caste village divided in terms of having multiplicity of interests and multiple loci of power. No caste is in a position to enjoy unquestioned authority and power to see its decisions through. Rajputs and brahmins are there but they are neither economically well placed nor numerically dominant. Gujars are in good number but are economically and occupationally not well placed. Khatiks are the richest in the village but are socially positioned lower in the caste hierarchy. Every group and every leader wants to keep its cards open and hence nobody takes any stand regarding the pasture.

The PIA, after the treatment of the pasture wanted to hand it over to panchayat. As the latter had handed it over for a period of five years it declined to take the responsibility of its maintenance before the five years completed. The PIA therefore gave the responsibility of its maintenance to the UC. One of the patches of pasture was well-maintained largely due to the efforts of the PIA which engaged a chowkidar for watching and warding over the pasture. It paid for the salary of the chowkidar from the account of the new patch being developed. Since the handover of the pasture to the UC, it had not accrued any income unlike Sundarcha. There was no rule set up for the protection or for benefit distribution.

The lack of concern towards the pasture has its root in encroachment also. In the 1960s, there was a lot of revenue wasteland in the village. Over the next decades these lands were allotted to villagers. At the moment, there is no revenue wasteland left in the village. The lack of concern at the village level continued and gradually led to opening the pasture for free grazing. One interesting point observed during the study was that one patch of land where the pasture was developed was earlier encroached by a villager. He vacated the land as the pasture development work took place. And as the PIA withdrew, he again encroached. Probably, weak institutions led individuals to take over the system.

Interestingly, in the same village people have come together for the cause of drinking water. They have been running a tubewell and water tank for the last five years effectively. A five-member committee looked after the management system. Every household in the village contributed Rs 15 every month. In the backdrop of a socially and politically divided community, community action of the kind mentioned here is not difficult to find if everybody in

the village has a stake. This puts a question mark on the proposition of whether the heterogeneity of a village community affects its institutions. Rather it points that pasture was probably not the villagers' priority. Availability of large tracts of private beeds fulfilled the grass requirement and the villagers had not felt shortage of grass till recently.

The pasture remained protected for less than a year after its handover. Then it was opened for grazing. In a span of four years it completely degraded and only traces of vegetation could be found. Remnants of soil conservation measures existed, and there were instances of taking away stones from the stone-fence.

Cluster 2: Kamli Macrowatershed

Village 4: Sangawas

There were around 200 households in Sangawas. Of them, about 60 per cent households were rawats, others belonged to castes and tribes such as kumhar, balai, baniya, dholi, baba and bhil. Agriculture was the main occupation of the villagers. A few people had government jobs. Some others worked in the private unorganised sector. Thus we categorised this village as moderately homogeneous in terms of caste composition. In this village, an area of 136 ha of pasture was developed. Part of it was revenue wasteland ('bilanam') and part pasture. Some of the villagers had encroached a part of the village pasture for decades. They opposed its development as the treatment of the pasture meant the removal of their encroachments. They also had the support of the then sarpanch who belonged to Sangawas itself. They were also worried about feeding the cattle in the village. This matter was sorted out finally by leaving out a portion of pasture for grazing of the cattle. It was also argued that the land, which was taken up for treatment, was highly degraded and the villagers would not gain anything if they chose not to enclose it for treatment.

After a few months of completion of the project, in July 1998, the PIA convened a meeting for the pupose of handing over the pasture. No new committee was formed and the same users committee which carried out works in the village continued to function as the custodian of the pasture. The panchayat had also shown interest to take over the pasture. In fact, the sarpanch had written to the PIA in order to take over the treated pasture. But the UC feared that the panchayat would allow free grazing in the pasture. The PIA, which had received active support from UC carlier, also felt that the UC would be able to manage the pasture properly and agreed with the arrangement.

Under the existing arrangement, the UC looked after the day-to-day management of the pasture and the system functioned well. But this antagonised the sarpanch. In 1999-2000, the panchayat collected fees from some of the villagers and allowed the cutting of the grass. This decision was unilaterally made without consultation with the UC. The latter expressed its reservations about the decision and the PIA also backed it. The panchayat finally returned the fees to those from whom it was collected. However, the grass was distributed among the villagers and the people who needed grass were not deprived of it.

During the implementation, the users committee faced problems from the neighbouring villagers (Naberi) also who continued to leave their animals into the pasture. At this point, the committee showed extraordinary resolve by instituting a system which would protect the pasture. Many of the UC members along with some other villagers under the leadership of the committee chairman kept watch over the pasture even during the night. They reported the matter to the police also. The involvement of the committee, the prevalence of active leadership and a supportive PIA in the programme during the project implementation made the task easier for the committee members in the post-project phase. Once the pasture developed properly, people who initially resisted the work also benefited from it. The only complaint this group had was that they were not consulted while taking decisions.

After two years of implementation, the villagers were allowed to cut grasses from the pasture. The income accrued from it was small and was utilised for the payment of the chowkidar. Those people who made signal contributions in protecting it still show the same level of motivation. Because of this success, the Kamli watershed, of which Sangawas is a part, received the National Productivity Award, and visitors from outside regularly come here on exposure visits. These visits also made people realise the importance of their efforts. The involvement of some of local workers of the Mazdoor Kisan Shakti Sanghathan (MKSS)[6] who were part of the committee also provided the much-needed enthusiasm and motivation to remove encroachments, and to ensure the protection of the pasture. While felling of trees was not allowed, considering the drought situation, grazing was allowed at a token fee of Rs 11 per head for animals, though only cattle/buffalo. As the trees were grown, they were not likely to be harmed by grazing.

The pasture was in a good condition. A controlled grazing system was followed and the stone fencing was intact. The case of Sangawas is an example of effective leadership under the overall guidance of the dynamic chairman of the users' committee. The village had a good management system in terms of keeping a watch on the pasture while accommodating the needs of villagers in the post-project phase.

Village 5: Rashmi

There were around 150-175 households in Rashmi, 90 per cent rawat and the other 10 per cent includes dholi, balai, bhil, etc. Only about four to five persons of the village have regular government/private jobs. Thus this village could be termed a homogeneous village in terms of caste composition. An area of 175 ha of pastureland was developed in this village. Agriculture and animal husbandry were the main occupations with the animal population as high as 3,000 of which 500 were cattle.

The pasture development work started in 1994 in this village. This pastureland consisted of two patches. The two patches were taken up one-by-one by the PIA for treatment. But the closure still affected the cattle in the village adversely. The villagers handled the situation by grazing their animals in nearby villages, such as Sangawas and Miyala. No stone fencing was constructed in the pasture lying adjacent to the village Thikarwas. The other patch lay towards the village Paton ki Aanti. There was already a stone fencing (developed by the panchayat) around the pasture when the project had begun. In July 1998, the PIA convened a meeting in the village and conveyed to the villagers their decision to withdraw from the village. The UC which had 14 members was given the charge of the protection and maintenance of the pasture. The committee agreed to protect the area and banned felling and grazing.

After the formal withdrawal by the PIA, the pasture remained protected for three to four months. Then the chairman of the UC received complaints of animals grazing in the pasture. As he could not stop the grazers, he communicated the matter to the PIA. The PIA officials visited the village and discussed with the people and a meeting of the UC was convened for this purpose but nothing concrete materialised. Conditions of drought and the shortage of fodder were the pleas on which grazing was allowed. The approach of the UC was also half-hearted as a couple of members of the committee itself had infringed the ban on grazing. It was also learnt that inhabitants of a neighbouring village (particularly Thikarwas) brought their cattle for grazing in the village pasture. Rather than stopping the villagers of Thikarwas, Rashmi villagers thought to benefit as well and once the pastures were open for grazing, this continued unabated. The ban on felling was also not observed. The panchayat (same as that of Sangawas) remained indifferent to the entire process.

The pasture was open for grazing and highly degraded. Traces of boundary plantation and sparsely distributed trees were found as remnants of the plantation. And there was no serious effort made for a way out – like closing one of the two patches or even a ban on felling. It could be concluded that the village did not develop any management system.

Village 6: Kundeli

In Kundeli, there were around 200 households. Rawats and kalals together constituted around 70 per cent of the village. Other castes living in the village were salvi and prajapat. Not more than 10 persons were in government jobs and about 30 people worked in regular private jobs. Thus this village can be called a moderately heterogeneous village in terms of caste composition. The animal population was about 1,500 of which cattle/buffalo population was 200 and the rest were goats.

The project activities started in 1993-94 and were completed in 1996-97. An area of 150 ha pasture was developed in this village. It was almost barren and there were sparsely distributed bushes when the work started. The closure did not affect villagers significantly as there was no vegetation on this piece of land. In July 1998 a village meeting was organised by the PIA and the pasture was handed over for maintenance to the UC. No new committee was formed. It was the same old 11-member users committee that took the responsibility of managing the pasture. The panchayat (same as Sangawas) was not interested in taking over the pasture.

The interventions in Kundeli were only a mediocre success unlike Sangawas. In this village the plantation was not successful, and the PIA did not expect much from the area. The villagers also did not have any significant interest in maintaining the pasture until an incident of tree felling by some people from a neighbouring village occurred. A group of people from the neighbouring village (Baraton ka Badiya) felled trees from the pasture of Kundeli. This shook the villagers; they united and reported the matter to the police. It led to the arrest of 20 persons from Baraton ka Badiya. After this, the villagers resolved to establish a local system for protection to avoid any incidence of tree cutting. Every day representatives of four households of the village would keep a watch on the pasture on a rotation basis. The turn of a household came approximately every one and a half months. In case of the absence of a representative of any household for watch and ward, a fine of Rs 80 per day was imposed. The village followed its traditional practice of holding village meetings on 'poonam' (full moon night) where they discussed common issues affecting the interests of villagers. People adhered to decisions taken in the meeting and issues related to pasture protection were settled in these meetings.

After two years of work the PIA allowed the cutting of grasses by villagers. No fee was charged. Felling trees and free grazing prevailed before the pasture development work took place in the village. During the project period, a ban on felling and grazing was observed. In the year of this study, grazing was allowed after the initial rounds of grass cutting took place. Villagers allowed animals from neighbouring villages also as the plants had grown well and animals would not harm the trees. The seriousness of this ban is reflected by the fact that nobody from the village could be seen in and around the pasture holding an axe. Anybody found to have indulged in any unauthorised felling was penalised.

Interestingly, many officials from the PIA do not consider this village a successful experience. One probable reason is the low survival of the plantation. Most of the seedlings could not survive. Villagers mentioned that most of the plants did not survive due to excessive cold in the year of plantation. When asked about the success of plantation in Sangawas, the villagers said, it had better site quality and better seedlings were planted. Although the plantation did not have a high survival rate, root stocks developed well as a result of the protection.

The case of Kundeli is a unique example of the traditional village institution taking the responsibility of managing the CPR. The practice of holding monthly village meetings also gave an opportunity to common villagers to keep in touch with issues related to the pasture. It was an excellent example of a self-evolved system in place in response to a development intervention.

IV
Analysis and Discussion

The preceding section describes the process of handing over of pasture and how the management system evolved during the project period and after the completion of the projects. A range of factors from social, economic and political compositions of communities to the kinds of efforts made by the PIA or users committees resulted in different responses in the studied villages. From the above the following patterns can be identified.

Physical and Material Conditions

From the discussion above it seems three important physical or material factors might have affected the results of pastureland development – per capita availability of pastureland, the livestock composition and the fodder economy vis-à-vis conservation efforts. In terms of physical conditions, the one common thing found across these villages is that they were all highly degraded when the conservation work started.

Per Capita Availability of Pastureland

In Sundarcha, Dipti and Sakroda, the area of land covered under pasture development is very low in comparison to the other three villages. The table gives a comparison of these villages. Sundarcha and Sakroda have small patches of pastureland taken for treatment. Dipti also has a small area, but there the number of animals is very low. Sangawas, Rashmi, Kundeli and Dipti have higher per user (animal and household) commonland, on the other hand it is low in the case of Sundarcha and in the

Pattern of Interaction and Outcome

The outcomes could be broadly categorised into two – first, where the system was working (Sundarcha, Sangawas and Kundeli) and second, where it was not (Dipti, Rashmi and Sakroda). These outcomes have been a result of different types of interactions.

Any of the above four features (physical and material conditions, attributes of community, rules in use and action arena) exclusively do not seem to cause the success/failure of an institutional arrangement. The fodder economy in the villages had a severe deficit and hence the need arose to increase fodder production. This need motivated different groups in the villages variously. In Sundarcha the conflicting interests led to the evolution of an institutional arrangement that helped in saving the conservation efforts. The institution established itself by drawing strength from the conflict situation. In Sangawas also the same pattern of interaction was observed. In Kundeli, the motivation for maintaining the conservation effort was drawn from external sources, where the community united because of external influx and established an institution for protecting the pasture. The same situation was observed in Rashmi also, but there the local dynamics brought in a consensus for joining in the league of open grazing rather than protecting the pasture. While in one case inter-village conflict worked as a motivator for conservation, in the other it worked the other way round. Probably the alleged default of one committee member in Rashmi was crucial for this contrasting result.

The process of interaction in Sundarcha and Sangawas brings another insight. In these two villages, there was no one step input-output relationship between interventions and outcomes. Rather the outcome generated after several loops of interactions. For instance in Sundarcha, first, the UC was replaced by the PDC representing all the sections of village. When conflict arose, a smaller committee was formed eliminating the people who supported open grazing. Thus the management systems in these villages evolved gradually. In this process, the village institution was strengthened suo motu. But in Dipti, Rashmi and Sakroda this process did not take place. The withdrawal of the PIA was relatively abrupt in these villages and the UCs were not capable enough to look after the system.

In Dipti the people showed little involvement in the programme and decisions were taken without consulting the villagers. Similarly in Sakroda individual interests were kept higher than collective interest. The benefit from pasture was also too small. Thus the mechanism in these two villages remained weak.

These case studies bring out some interesting findings. The following points capture some additional factors overarching all the above-mentioned factors:

Economic logic: Olson's criteria that collective effort succeeds when the total gain exceeds the total cost by as much as or more than the gain to the group exceeds the gain to the individual [Olson 1971, pp 24-25] explains some of the outcomes. The case of Sakroda is that of cost exceeding benefits. One of the factors for people in Rashmi not coming forward for protection was that they feared that the benefits were being taken away by someone else. The smaller groups in Sangawas and Sundarcha also tried to maximise their respective benefits which led to conflicts in these villages.

Emergence of competing groups: There are instances when going by simple economic logic would not provide answers of the success or failure of management systems. In Dipti and Rashmi the need for pasture development existed, but a system could not be established. On the other hand, in Sundarcha there was no significant economic logic for protection but it became a symbol of issues, aspects or politics not closely connected with the common land itself. The emergence of competing (and persistent) groups led to the evolution of a system for protecting the pasture.

Informal people's institutions: The informal village level institutions such as UC and PDC played a decisive role in the protection of the pastures. These institutions were neither registered nor constitutional bodies. It was also observed that the panchayat took interest where the sarpanch had some interest in the pasture. A strong village institution superseded the influence of social composition which is generally considered more important in collective decision-making. Rashmi and Dipti were relatively homogeneous in terms of caste composition but they could not build a consensus for the protection of the pasture. Rather, occupational, economic and political groups influenced people in coming to a decision.

Passing the critical stage: In all the cases where the management system was running successfully, it was observed that the institution had a stronghold after it passed a critical stage. In Sangawas, the reversal of the panchayat's order for cutting grass was a critical point. In Sundarcha, the open grazing effort was dealt successfully albeit with a great difficulty. The successful lobby for protecting the pasture shifted the control to the pro-protection group. In Kundeli, illegal felling by the neighbouring village awakened the village and that led to a collective decision. On the other hand, in Rashmi the situation was not dealt with persistence. When the neighbouring villagers cut the trees, the villagers joined them. Similarly, when there was shortage of pasture, open grazing was allowed, without any innovation to cope (as occurred in Sangawas to cope up with the drought situation allowing a controlled grazing).

The interest of the facilitating agency also played a key role. As the villages Sangawas and Sundarcha responded positively to the intervention made by the PIA, they received more attention than the other villages. Understanding the local situation, the PIA identified people with a strong orientation for conservation efforts. Dipti, Sakroda and Rashmi never became the priority of the PIA as these villages did not respond favourably to the project interventions. Kundeli was one exception where the village itself evolved an institutional arrangement.

To the policymakers, the study provides some useful insights. These villages displayed a unique set of local dynamics and the PIA responded differently as no clear-cut guidelines were available at the time. Later in 1999 a set of guidelines was issued that recommended that the panchayat should be given the first preference in handing over control and only if the latter is not interested other arrangements could be made [GOR 1999]. In the case of these six villages such generic procedures could not have done well. The government policy for the management of these CPRs must accommodate the possibility of acting in accordance with the local dynamics. Any rigid guideline for bypassing village institutions is likely to cause a failure in establishing management systems.

V
Concluding Remarks

CPR is an economic resource subject to individual use but not individual possession. The main problem in the management of CPRs is how to coordinate individual users to attain sustainable use of resources. The cases discussed in this paper clearly indicate the role played by village institutions in sustaining the CPRs. The PIA or facilitating agency needs to spend sufficient time to understand the local scenario, both social and geophysical, and design institutions fitting into local conditions. An element of manoeuvrability would be required on the part of managers in this regard as no model is final for collective action. The group dynamics may change from time to time and the facilitator would have to make changes accordingly in the institutional arrangements confirming the following statement by Ostrom:

> Whether or not any equilibria are possible and whether or not an equilibrium would be an improvement for the individuals involved (or for others who are in turn affected by these individuals) will depend on the particular structures of the institutions. In the most general sense, all institutional arrangements can be thought of as games in extensive form. As such, the particular options available, the sequencing of those options, the information provided, and the relative rewards and punishments assigned to different sequences of moves can all change the pattern of outcomes achieved [Ostrom 1990: 22-23].

The guidelines issued by the government of India for watershed programmes (in 1995 and 2001) emphasised implementation by either registered village bodies or panchayats. The Hariyali guidelines 2003 however emphasise implementation only through the panchayati raj instutions. In this study it was found that panchayats did not work as neutral and impartial bodies and favoured particular interest groups. In view of this it could be recommended that panchayats would need a lot of capacity building on technical and institutional issues to handle commons development. Whosoever is the implementing agency undertaking commonland development, it should be prepared to see that underneath the formal structures there are informal processes, groups and factions and manoeuvre them to the advantage of the management system there.

In conclusion it can be said that the CPR management systems can be institutionalised through in-depth understanding of the local needs and dynamics associated with the CPR. The first step towards it is the identification of various groups favouring or opposing it. In the second stage, continuous dialogue with the community and transferring the management responsibility to them with the PIA being present in the village could be most useful. The most crucial judgment of the time of complete withdrawal of the PIA from the area could be made after the local institution tackles critical problems successfully. EPW

Email: pradeepmishra.irma@gmail.com, f033@irma.ac.in
mksm_raj@rediffmail.com

Notes

[This paper is based on the cases developed by the authors as part of a study *Post-project Management in Completed Watersheds* for ARAVALI, Jaipur. A version of this paper has earlier been prepared in the form of a study report. The authors acknowledge their thanks to ARAVALI, Jaipur, which has permitted the authors to publish this paper. The authors acknowledge their gratitude to G D Vyas, Sachin Sachdeva and Jai Pal Singh from ARAVALI, Prema Gera and Srinivasan Iyer of Aga Khan Foundation; Parag Chaudhuri, M L Dashora of department of WD & SC; Shashi Bhushan Singh, PhD scholar of Delhi University and Rao Ratan Singh who contributed to the study in a variety of ways. Thanks also to Vishwa Ballabh, IRMA, for his suggestions on the framework of analysis and the anonymous referees for their comments.]

1 The desert development programme (DDP), drought prone area programme (DPAP), integrated wasteland development project (IWDP) and national watershed development project for rainfed areas (NWDPRA). The importance of pasture development can be gauged from the fact that in the year 2003, a special programme Maru Gochar Yojana [PIB 2003] was launched for the desert districts of Rajasthan specifically for the development of pastureland at an estimate of Rs 500 million.

2 The first phase of NWDPRA was implemented during 1990-91 to 1996-97.

3 As the panchayat grants permission for the pasture development work, it would have been a logical step to hand over the pasture to it. But there was no clear instruction from the PIA directorate and in some cases the field staff apprehended that the panchayat would not take care of it. They therefore responded differently depending upon their perception, the mood in the village and the usual practice being followed by the department. This resulted in different trajectories of withdrawal and the establishment of different systems of management in different villages.

4 Approximately Rs 3,500 per ha was spent in conserving these pastures as an initial investment during the project period. This amount excludes the post-project watch and ward and maintenance works.

5 This revenue is quite laudable as the last two years have been drought years in the area.

6 MKSS is a people's movement based in the area that organises the community for their right to information.

References

Adams, W M, Dan Brockington, Jane Dyson, Bhaskar Vira (2002): 'Analytical Framework for Dialogue on Common Pool Resource Management', presented at the Commons in an Age of Globalisation, the Ninth Conference of the International Association for the Study of Common Property, Victoria Falls, Zimbabwe, June 17-21, 2002, URL: http://dlc.dlib.indiana.edu/archive/00000778/00/adamw020402.pdf, accessed on 4.11.2006.

Chopra, Kanchan, Gopal K Kadekodi and M N Murty (1990): *Participatory Development: People and Common Property Resources*, Sage Publication, New Delhi.

GOR (1999): 'Government Order No 305-335 dated March 15, 1999 on handing over of assets created under NWDPRA programme', Director, Watershed Development and Soil Conservation, Jaipur, Rajasthan.

Hardin, G (1968): 'The Tragedy of Commons', *Science*, 162, pp 1243-48.

Hegde, N G, M S Sharma and R Rawal (2001): 'Community Pasture Development: A Sustainable Model for Food and Ecological Security', presented at the National Workshop on Natural Resources Management and Watershed Development. December 21, New Delhi; http://www.baif.com/additional_tree6.htm accessed on 15.12.2004.

Jodha, N S (2001): *Life on Edge: Sustaining Agriculture and Community Resources in Fragile Regions*. Oxford University Press, New Delhi.

Kumar, Mukul and Pradeep Kumar Mishra (2001): 'Post Project Management in Completed Watersheds', ARAVALI, Jaipur.

Oakerson, R J (1986): 'A Model for the Analysis of Common Property Problems' in Katar Singh, *Managing Common Pool Resources: Principles and Case Studies*, Oxford University Press, Delhi.

Ostrom, Elinor (1990): *Governing the Commons: The Evolution of Institutions for Collective Action*, Cambridge University Press, New York.

–(1999): 'Institutional Rational Choice: An Assessment of the Institutional Development Framework' in P Sabatier (ed), *Theories of Policy Process*, West View Press, Boulder, pp 35-71.

Olson, M (1971): *The Logic of Collective Action: Public Goods and the Theory of Groups*, Harvard Economic Studies, Vol CXXIV, Harvard University Press, Massachusetts.

PIB (2003): Press Release on Maru Gochar Yojna, June 10, 2003, Press Information Bureau, http://pib.nic.in/archieve/lreleng/lyr2003/rjun2003/10062003/r1006200315.html

Singh, Katar (1994): *Managing Common Pool Resources: Principles and Case Studies*, Oxford University Press, Delhi.

UNDP (2001): *Rajasthan Human Development Report*, UNDP, New Delhi.

Wade, R (1988): *Village Republics: Economic Conditions for Collective Action in South India*, Cambridge University Press, Cambridge.

case of Sakroda it is abysmally low. We did not find any correlation between the size of the pastureland and success/failure. In Dipti and Rashmi the pasture failed despite larger per capita availability but it worked in Sundarcha despite smaller per capita availability. In Sundarcha outputs of the pasture could not meet all requirements of fodder in the village, but could only plug in the critical gap in fodder shortage. In Sakroda, the size of the pastureland developed was too small and as there was a lot of private pastureland (beed) available, pasture development was probably not the priority. In Rashmi and Dipti, pasture could have met a significant portion of the fodder requirement of the village but it still did not work. Hence, except in Sakroda, the size of the pasture has not contributed to the success/failure of the pasture management.

Livestock Composition

It is generally believed that small animals are rarely stall-fed and these villages were no different. With this logic, a greater number of small animals (goat and sheep) could have adverse effect on conservation efforts but in these villages no such thing was observed. Sundarcha and Dipti have a greater number of bigger animals (cattle and buffalo). Interestingly, the conservation efforts failed in Dipti but worked in Sundarcha. The rest of the four villages have mostly smaller animals. Out of these four in two villages conservation efforts failed while in the other two they were successful. This implies that as a single factor many small animals might be inversely related with conservation efforts but when it works in combination with other factors its effects may be neutralised by them.

Fodder Economy and Conservation Efforts

Requirements of fodder in these villages are met either by commonland, private beed, crop residues, or purchases of fodder from the market or from outlets set up by government for sale at subsidised prices. This proportion of fodder from different sources is not fixed as it changes with the variation in rainfall, groundwater level and crop outputs. Although the situation varies from village to village and year to year, the contribution of commonlands is substantial in normal years except in Sakroda where private beeds are ample and Sundarcha where the conserved pastureland is too small to meet the fodder needs of the villagers. Except for Dipti, no other village has forestland nearby but there also entry to forestland was restricted. In Rashmi and Dipti also, where conservation efforts failed, the contribution of commonlands was substantial for any normal year, the study however did not make any quantitative estimates.

In the months following the beginning of monsoon rains called 'chaumasa' there is adequate outgrowth of green grass and other bushes and shrubs for animals to graze in the area, but it lasts only till the end of chaumasa, i e, the end of October-November Leaves and pods of khejri and desi babool, crop residues of maize, black gram, groundnut, guar (cluster bean), jowar, wheat, chana and barley are also used to meet the fodder requirement. Only a few farmers cultivate green fodder like 'rachka' in years of normal rainfall. However, when field work for this study was done, these villages were in severe drought with the third year in succession. Due to this, a large area was kept fallow and this left the farmers with insufficient crop residues. The production of green fodder (rachka) was negligible as one required water to irrigate it. In the drought years there was severe scarcity of fodder and water and people had to depend on purchases from the market and government supplies for approximately three to six months in a year for feeding animals. This scarcity of fodder also had its effect on livestock composition as people tried to sell off their dry animals, retaining the milching ones.

The need to arrange for fodder builds definite pressure on pasturelands to be opened up. However, only villages opted for controlled use rather than unrestricted and unregulated use at pasture. Drought is a recurrent phenomenon in this region. It is a choice before the villages whether to keep using it sustainably over the long run or exploit it at one go, and this choice is made out of a combination of physical, social and economic factors.

Table

	Sundarcha	Dipti	Sakroda	Sangawas	Rashmi	Kundeli
Area developed (ha)	50	40	36	136	175	150
No of households	400	80	500	200	175	200
Animal population	2000	200	4000	1000	3000	1500

Attributes of the Community

Sundarcha, Sakroda and Sangawas were heterogeneous in terms of caste composition. Sakroda can be termed as the most heterogeneous one. Kundeli, Rashmi and Dipti were more or less homogeneous villages, Rashmi being the most homogeneous. In terms of occupation, the most heterogeneous would be Sundarcha as there were a good number of people working in the private sector. Other villages were primarily dependent on agriculture and animal husbandry. Thus homogeneity in terms of caste did not influence the outcome of the intervention.

Rules-in-Use

In the three villages where the management system was working, different rules had been established. In Sangawas, the auction system and preference to villagers in the sale of grass was followed, while in Kundeli, the grass collected was distributed for free. In Kundeli, controlled grazing was allowed after the first round of grass cutting, although felling of trees was completely banned. In Sangawas, meetings were held regularly while in Sundarcha only when major decisions were to be taken. In Kundeli, it was held every month full moon night.

Action Situations and Actors

Among the six villages, four had a bipolar conflict of interests. One group was in favour of protection and the other was against it. Their claims were different and the pattern of support was also different. In Sangawas and Sundarcha where the system was established successfully, there was intra-village conflict of interest and in Kundeli the conflict was inter-village. In Sundarcha it was brahmins vs gujars, in Sangawas it was the panchayat vs users committee and in Kundeli it was the village vs the neighbouring villages. In Rashmi an intra-village conflict ensued for some time but it could not allow any system to be established. In the other two villages there was hardly any conflict and no system could be established. This brings out the positive features of conflict which helped in the emergence of a strong group favouring protection of pasture.

64