SCIENCE AND ENVIRONMENT FORTNIGHTLY

Down To Earth

MARCH 16-31, 2011

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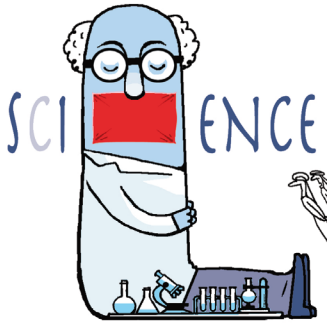
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Indian scientists: missing in action

I suspect Indian scientists have retired hurt to the pavilion. They were exposed to nasty public scrutiny on a deal made by a premier science research establishment, Indian Space Research Organisation (ISRO), with Devas, a private company, on the allocation of spectrum. The public's verdict was that the arrangement was a scandal; public resources had been given away for a song. The government, already scam-bruised, hastily scrapped the contract. Since then there has been dead silence among the powerful scientific leaders of the country, with one exception. Kiran Karnik, a former employee of ISRO and board member of Devas, spoke out. He explained it is wrong to equate this deal with the scam of mobile telephony, where it was alleged that the minister fiddled with procedures to hand out spectrum at throwaway prices. The reason is that this band of spectrum called S-band, reserved for use in satellites, is different from terrestrial spectrum used by mobile operators. In the S-band the users are different, risks are higher and the customer base is smaller. Hence, the cost calculations done for terrestrial spectrum cannot be used to estimate the loss to the exchequer in the ISRO-Devas contract.



Science journalist Pallava Bagla explains there is a clamour for government to "free" S-band for cell phones in a terrestrial setting. This has been done in Europe, also under pressure from private operators. Clearly, there is much more to this story. But when the scientists who understand the issue are not prepared to engage with the public, there can be little informed discussion. The cynical public, which sees scams tumble out each day, believes easily that everybody is a crook.

But, as I said, India's top scientists have withdrawn further into comfort holes, their opinion frozen in contempt that Indian society is scientifically illiterate. I can assure you in the future there will be even less conversation between scientists and all of us in the public sphere.

This is not good. Science is about everyday policy. It needs to be understood and for this it needs to be deliberated openly and strenuously. But how will this happen if one side—the one with information, knowledge and power—not engage in public discourse?

Take the issue of genetically modified (GM) crops. For long this matter has been decided inside closed-door committee rooms, where scientists know their decisions will not be challenged. Their defence is "sound science" and "superior knowledge". Interestingly, the same scientists will accept data produced by private companies pushing the product. Issues of conflict of interest will be brushed aside as integrity cannot be questioned behind closed doors. Silence is the best insurance. This is what happened inside a stuffy committee room, where scientists sat to permit Mahyco-Monsanto to grow Bt brinjal.

This case involved a vegetable we all eat. This was a matter of science we had the right to know about and decide upon. The issue made headlines. The reaction of the scientific fraternity was predictable and obnoxious. It resented the questions. It did not want a public debate.

As the controversy raged and more people got involved, the scientists ran for cover. They wanted none of this messy street fight. They were meant to advise prime minister and the likes, not answer simple questions of simple people. Finally, when environment minister Jairam Ramesh took the decision on the side of the ordinary vegetable eater, unconvinced of the validity of the scientific data justifying no-harm, scientists were missing in their public reactions. Instead, they whispered about lack of "sound science" in the decision inside committees.

The matter did not end there. The minister commissioned an inter-academy probe—six top scientific institutions looked into GM crops and Bt-brinjal—expecting a rigorous examination of the technical issues and data gaps. The report released by this committee was shoddy; it contained no references or attributions and not one citation. It made sweeping statements and lifted passages from a government newsletter and even from global biotech industry. The report was thrashed. Scientists again withdrew into offended silence. The final report of the apex science group is marginally better in that it includes citations but it reeks of arrogance cloaked in jargon. The committee did not find it fit to review the matter, which had reached public scrutiny. The report is only a cover for their established opinion about the "truth" of Bt brinjal. Science for them is not a matter of enquiry, critique or even dissent.

But the world has changed. No longer is this report meant only for top political and policy leaders, who would be overwhelmed by the weight of the matter, the language and the expert knowledge of the writer. The report will be subjected to public scrutiny. Its lack of rigour will be deliberated, its unquestioned assertion challenged.

This is the difference between the manufactured comfortable world of science behind closed doors and the noisy messy world outside. It is clear to me that Indian scientists need confidence to creatively engage in public concerns. The task to build scientific literacy will not happen without their engagement and their tolerance for dissent. The role of science in Indian democracy is being revisited with a new intensity. The only problem is that the key players are missing in action. ■

—Sunita Narain

SCIENCE AND ENVIRONMENT FORTNIGHTLY

Down To Earth

MARCH 16-31, 2011

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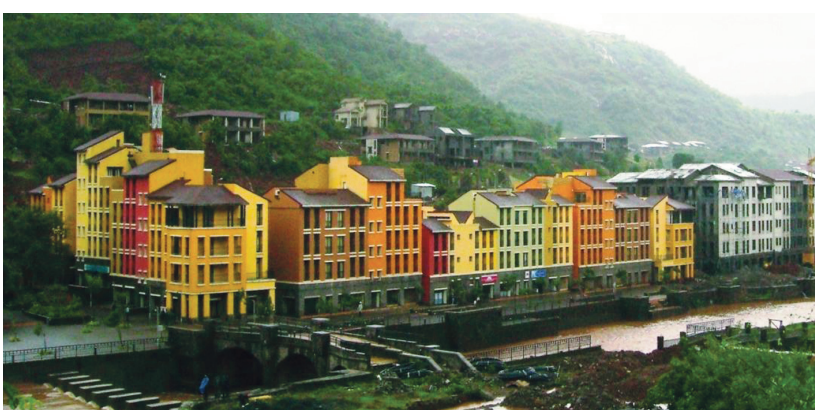
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HOW LOVE OF SCIENCE IS KILLED



PHOTOGRAPHS: SAYANTAN BERA / CSE

The article 'In wait for revamp' (February 1-15, 2011) is bound to touch the hearts of science students in India who are forced by the prevailing conditions to take up job-securing courses. They are unable to pursue pure science research due to lack of patronage from governments and the private sector.

School and college level science laboratories lack basic infrastructure to lay foundations of science in adolescents. Science graduates churned out by the thousands of degree colleges in the country see no future because of the weak foundation and lack of career opportunities. Students pursuing other disciplines have better career opportunities than those pursuing pure science. As a result, science students end up as schoolteachers and bank clerks.

The education system is like an orphan child, whose basic needs are fulfilled but does not get quality upbringing. Even the famed Indian Institute of Advance Studies in Shimla, with crores of rupees of annual budget for research, does not have any science faculty.

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GM REPORT FOOLED NO ONE

Instead of settling the raging controversy over GM food, especially Bt brinjal, the Inter-Academy update on GM crops has further confused the issue ('Scientifically invalid', January 16-31, 2011). The six self-contradicting recommendations reveal that the exercise was a failure.

The arguments raised by the opponents are well balanced and more objective than those favouring GM foods. It is amazing how the experts in the Inter-Academy could bring out a document that is confusing and lacks basic data. The update fails to convince the scientific community and the general public that GM foods are "absolutely" safe for human consumption.

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BUILDERS RULE

The article 'Will future cities be friendly?' (February 1-15, 2011) accurately portrays the paradox of development projects criss-crossing our metros and small towns. We have swanky malls, metro stations and air-conditioned buses plying on the bus rapid transit corridors. They surround cramped houses, narrow alleys, sidewalks and playgrounds that are shrinking rapidly.

City developers blatantly ignore sustainability and availability of resources. In Delhi, for instance, most expansions are illegal. Rapidly mushrooming mini townships are glaring examples of how expansion policies are ignoring basic criteria like power, water supply, ventilation and availability of transport, all very crucial for sustainable living conditions.

Huge malls and mini-townships built by encroaching builders next to slum areas in the name of development are an eyesore.

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✉ Urbanisation is the need of the hour. But it should be based on the needs and demands and not on planners or builders. Development should be sustainable in respect to economic,



social and cultural aspects. Any deviation from this concept leads to destabilisation.

I have witnessed growth and development of Delhi, Kolkata, Mumbai, Bengaluru, Chennai and Hyderabad since 1980s. Sorry to say that the quality of life has deteriorated. Along with development, we have created urban slums, vulnerable to health hazards.

Is this the kind of development we want?

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BLACK CARBON STORY

Interpretation based on remote sensing data is not an ultimate doctrine to support or disprove glacier retrieval or progress ('Melting uncertainty', February 16-28, 2011). Himalayan glaciers have a large amount of black carbon that reduces the albedo or reflection coefficient of ice and enhances melting. The glacial moraine also contains large volume of black carbon deposited during and after snowfall. Substantial amount of black carbon is generated from villages in higher Himalayas as well as from the towns at the foothills.

For instance, Leh, the capital of Ladakh, meets its electricity demand from diesel generators. It burns three million litres of diesel to get about 8 MW of electricity. Assuming 0.84 gramme per litre (g/L) of black carbon emission from diesel, the fuel alone contributes 2.5 mega grammes of black carbon to this pristine Himalayan environment. This could be higher because combustion of diesel is incomplete at an altitude of 4.5 km. In fact the black carbon emission in Leh will be much higher if other sources like use of biomass and dung for cooking and heating homes during winters are also considered. All these emissions get deposited along with the snow. Ice cores recovered from Rongbuk glacier, in southern Tibet, contain about 20 mg/kg of black carbon. The global average is 5 mg/kg.

D CHANDRASEKHARAM
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INSURING FARMERS

All that farmers want is an assured income and protection from erratic weather ('Farmers want support', February 16-28, 2011). Crop insurance should cover destruction due to erratic weather. The government should provide special storage facilities for fruits and vegetables in villages and proper transport facilities.

Research plays an important part. The government should convert all the pump sets to solar-powered ones. The agriculture budget should be prepared after consultations with farmers and their organisations.

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CHANDRA BHUSHAN / CSE

MORE POLLUTION IN STORE

At present 333 sponge iron factories produce 29.2 million tonnes per annum of iron ('Neo iron age', January 16–31, 2011). The ministry of steel plans to increase the number of factories to 431. The question is: why is India adding these polluting industries instead of setting up integrated steel plants where pollution control could be more effective even though it might lead to displacement and rehabilitation of people. The government should rather adopt the latest technology to control pollution and ensure energy efficiency in the production of steel.

T N K KURUP
Bengaluru

THEFT OF THE COMMONS

Encroachment of common land is a common practice in villages of India ('Return of village land', February 16-28, 2011). A village in Hisar district of Haryana has lost most of its common land due to encroachment. But I doubt there will be any complaint against encroachers as rich and influential people are involved. An increase in land price has also triggered the problem.

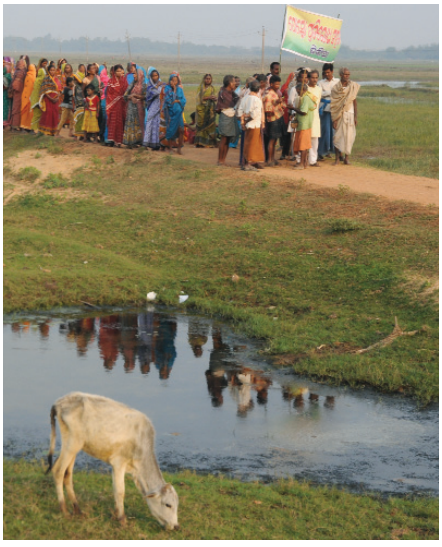
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✉ Theft of common land in the UK is still fresh in our memory. We lost thousands of acres of commons during the enclosure movement in the 18th and 19th centuries. The movement was used to take away the traditional rights of mowing meadows for hay or grazing livestock. Recently, The Open Spaces Society, Britain's oldest national conservation body, was able to reverse a government decision to sell publicly owned forest estate. It is an important victory for us.

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NEOLIBERAL DREAM

The environmental and social cost of the POSCO project in Odisha's Jagatsinghpur district outweighs the economic gains to be made by the company and the state government ('POSCO gets green signal', February 16-28, 2011). The project will destroy livelihoods as the government will give away land to the South Korean multinational. The project has already marginalised people rather than bring employment opportunities. Such a modernisation project along the Odisha coastal belt is a neoliberal dream.



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LEFT IN THE LURCH

The weather variables that cause drought, rains and floods are not new. It is the government and agencies unpreparedness that causes misery to the farmers ('Bitter harvest: farmers kill selves', February 1-15, 2011). Agriculture universities and research

institutes claim to have developed drought- or cold-resistant varieties of crops. Varieties that can withstand waterlogging when rains inundate the fields are also available. Then why are these not available to farmers?

Making such varieties available in sensitive areas can help avoid suicides. Researchers and seed companies have a great role to play in addressing calamitous situations in the agriculture sector.

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MOBILES AND BIRDS

Do mobile phone towers affect bird migration ('Warning signal', January 16-31, 2011)? As a schoolboy I used to keep pigeons and found that the birds released took longer to find their way back if there were radio transmitting stations in their flight path. Years later, I came across an article which mentioned that similar observations were made in England and Japan. There must be "electronic smog" in many parts of the world today. I would appreciate any latest information available on this subject.

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✉ Cell phones have become so common that even schoolgoing children use them. Parents love to watch their toddler's reaction while talking to them on cell phone. If they are aware of the radiation risk they will think twice before pressing a mobile against their toddler's ears.

VIHAY KUMAR
Surat

AN EXPENSIVE PROPOSITION

Removing batteries from municipal solid waste and streaming them into recycling might reduce the toxic impacts, but battery recycling is not environmentally benign ('Power & precision', February 16-28, 2011).

Scientists explain that there is significant transportation and related fuel costs to get batteries to recycling facilities and sort them into chemically related classes of materials. Battery recycling processes also require significant amounts of energy. It takes six to 10 times more energy to reclaim metals from batteries than by other means. Some batteries contain toxic metals such as cadmium, mercury, lead and lithium. These are hazardous waste and pose threats to health and the environment. Manufacturers and scientists are working towards producing designs that contain fewer toxic material.



SURYA SEN / CSE

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Farmers feel left out

The budget is more concerned about the consumer than the grower

LATHA JISHNU AND JYOTIKA SOOD

A LOOMING food crisis in the world and high food inflation rates at home made Pranab Mukherjee's proposals to boost agriculture in his 2011 budget more keenly watched than usual. These are factors that clearly weighed with the finance minister who repeatedly said that his principal concern this year has been the continuing high food prices. The squeeze on the consumer who did not benefit from the seasonal fall in prices was a recurring theme in his speech.

But did the deepening agrarian crisis in the country which has seen no let-up in the number of distressed farmers taking their own lives determine his allocations? Going by the reactions of farmers' organisations and agriculture analysts to his proposals, the finance minister, it seems, has not kept the farmer at the centre of his formulations.

The domestic landscape has been darkened by freak weather in several parts of the country where frost and unseasonal and heavy rains have laid waste farmlands in half a dozen states. According to one estimate, crops in 7.5 million hectares have been destroyed in Andhra Pradesh, Odisha and Tamil Nadu. In past weeks, farmers in Madhya Pradesh, normally not high on the suicide index, too took their own lives after frost destroyed their crops.

So although Mukherjee announced a range of measures to keep up the momentum in agriculture, which has grown at an estimated 5.4 per cent during 2010-11 after two successive years of dismal growth (1.6 per cent in 2008-09 and 0.2 per cent in 2009-10), no one is cheering. Yudhvir Singh, general secretary of the Bhartiya Kisan Union, says the budget has completely upset farmers. "There is nothing for the Indian farmer in the budget," he declares, dismissing even the increase in interest subvention from 2 per cent to 3 per cent as of no significance.

The other big farmers' organisation,



REUTERS

Allocations to the Ministry of Agriculture

Funds received by the three departments since 2009-10 (in ₹crore)

Ministry of Agriculture	2009-10 actuals	2010-11 revised estimates*	2011-12 budget outlay
Department of agriculture and cooperation	11,675	17,695	17,523
Department of agricultural research and education	3,210	5,165	4,958
Department of animal husbandry dairying and fisheries	971	1,356	1,696
Total allocation	15,856	24,216	24,177
Total allocation as proportion of the budget	1.55%	1.99%	1.92%
Total allocation as proportion of GDP	0.24%	0.31%	0.27%

*Actuals up to November 2010 + 4 month projections

Source: Compiled by Centre for Budget and Governance Accountability from Expenditure Budget Vol. II, Union Budget 2011-12, Government of India

the Bharat Krishak Samaj (BKS), is unhappy, too. "The budget misleads more than it reveals. The allocation for the agriculture sector is far below our expectations," is the terse comment of its chairperson Ajay Jakhar.

But first, a look at the main incentives that Mukherjee is offering the sector. The eye-popping number is the huge step-up in agricultural credit. The budget raises the target of credit flow to farmers from ₹3,75,000 crore this fiscal to ₹4,75,000 crore in 2011-12, and the minister says banks have been asked to step up direct lending to small and marginal farmers. This is an almost 25 per cent jump in credit. The other is the allocation from the Rashtriya Krishi Vikas Yojana (RKVY), which is being increased from ₹6,755 crore to ₹7,860 crore. RKVY is intended to maximise returns to farmers by getting states to increase their investment in this sector.



Yet, "the budget lacks a vision and a strategy for keeping farmers on the farm," laments eminent agriculture scientist M S Swaminathan who has been campaigning for long to provide income security to India's poor and marginal farmers. "While the finance minister has emphasised the need for reaping a demographic dividend from our youthful population there is no strategy or programme for attracting youth to farming." The various reports produced by the National Commission on Farmers that he headed, including a National Policy on Farmers, has been gathering dust.

An immediate concern of the farmers is credit. Jakhar says the credit policy is misleading because "it is generally believed that this humungous amount (₹4,75,000 crore) will be dispersed to farmers at a subvention inclusive rate of 4 per cent. This is incorrect." Increasingly, loans to farmers constitute a very small part of what is shown as agricultural credit. Since 1993, indirect loans have been treated as agricultural loans as the definition has been broadened to include even the loans given to the state electricity boards for putting up wires and to dealers of companies selling agriculture-related products to farmers. Banks have thus been claiming a huge proportion of farm loans is a write-off. "Thorough verification of bank records is needed to check if the banks are showing non-agriculture loans as agriculture loans. Details of how much money is being dispersed as cash loans to the farmers at a reduced rate must be revealed in the Budget. Only then will the true picture emerge," insists the BKS chief.

Similarly, Yudhvir Singh points out that the higher interest subvention announced by finance minister is only for short-term crop loans. "If you take agriculture inputs like tractor and tubewells, the financial institutions charge rate of interest of 11 per cent."

So, overall is the budget a washout for the agriculture sector? Nilachala Acharya, analyst with the Centre for Budget and Governance Accountability (CBGA) in Delhi, worries that the expenditure on agriculture as a percentage of the total budget is showing a marked decline. From a high of 15.7 per cent in 2008-09, allocations have come down to 10.3 per cent and as a percentage of GDP (current market price) it has slumped from 2.5 to 1.4 per cent. In fact, the hike in RKVY is not all that significant considering that the government had intended to disburse a total of ₹25,000 crore under the scheme during the 11th Plan which ends this fiscal. The total allocation even with the current hike takes it to just 90 per cent. Acharya's complaint is that the so-called new schemes, such as the ₹300 crore for millets, are all part of RKVY.

Besides, the allocations for many of the programmes which should have received a huge boost are woefully inadequate, specially the funds for ushering in the new Green Revolution.

CBGA's calculations show that the ₹300 crore earmarked for 60,000 pulses villages in rainfed areas would mean an average allocation of just ₹50,000 per village. However, the ₹300-crore millet programme in 25,000 villages (covering one million farmers in 1,000 compact blocks) may fare better with each village getting ₹1.2 lakh annually.

The general verdict is that a trickle of funds is unlikely to result in a bumper harvest, either for the farmer or for the country. ■

How green is budget?

No incentive for buses, no brakes on diesel cars

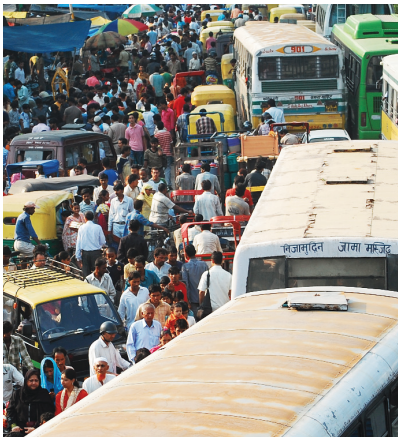
ANUMITA ROYCHOWDHURY

THE Union budget has announced its usual palliative for inclusive growth and *aam aadmi*. But the urban *aam aadmi* loses all.

Despite loud protests this year, especially from the environment minister who condemned the misuse of under-taxed diesel in cars and SUVs, the finance minister could not summon courage to increase taxes on vehicles. He is willing to forego revenue to support this luxury use. The proposed tax cuts on hybrid, electric vehicles and fuel cell cars—fancy of the rich—though well intended, cannot deliver real benefits if the status quo on diesel cars is maintained. Most stark is the neglect of buses, the vehicle of the masses. Financial assistance is available only for a few lines of expensive metro in Delhi, Mumbai, Chennai, Kolkata and Bengaluru.

This is the green budget for the polluted, congested and energy-constrained Indian cities where three-quarters of people earn less than ₹85 a day.

The finance minister is blinded by the growth story of the Indian automobile market and applauds it as "the second fastest growing in the world" which has shown



nearly 30 per cent growth this year.

He is silent on how motorisation might worsen the impact of the oil crisis on an economy which is 80 per cent dependent on imported oil.

The Central government simply gives up responsibility for bus transport that meets 40 to 60 per cent of the travel needs in key cities. It is content with the past gesture of one-time grant for 15,260 modern low-floor and semi-low-floor buses under the 2009 stimulus package. The finance minister said "this has transformed the urban transport across India" and offered no more tax concession for buses or schemes to scale up bus transport.

The auto industry stands to gain from the finance minister's overall growth mantra that puts brakes on the rollback of the fiscal stimulus. The minister has done so "to improve business margins and translate that into higher investment rates."

There are now worries about auto industry extracting more concessions from the tax reform package. The finance minister has promised to stay on course to phase in the proposed flat tax rates under goods and services tax (GST) and "maintain the standard rate of Central excise duty at 10 per cent." If the country and Parliament are not vigilant the auto industry will try to get the same 10 per cent GST on all passenger vehicles regardless of size, engines or emissions performance. The only check of 22 per cent excise and special duty on big cars and SUVs will also go.

It will be a joke on the nation if Parliament allows this budget to pass without extracting more concession for bus transport and halting the luxury use of under-taxed and polluting diesel. This will bury the pretence of green budget for ever. ■

The green pretence

For hybrid, electric mobility and fuel cell cars: Full exemption from basic customs duty and special countervailing duty to specified parts. Concessional rate of excise duty of 5 per cent to incentivise domestic production. Concessional excise duty of 10 per cent to fuel cell or hydrogen cell technology to vehicles

For public transport: Financial assistance for Delhi Metro Phase-III and Mumbai Metro Line III, and the ongoing Metro projects of Bengaluru, Kolkata and Chennai

Diesel fuel: Budget has provisioned less for oil subsidy in 2011-12 than the current fiscal. Will this increase diesel fuel prices?

Too little for renewables

The sector remains a low priority for government

RUHI KANDHARI

THE Union budget's approach to the renewable energy sector remains scattershot. The only mention the sector gets in the 2011-12 budget is when it talks about the duty cuts on the energy-efficient LED lights, solar lanterns and solar cells.

"Except for the small concession of withdrawing customs duty on inputs required to make solar modules and cells, and reducing customs duties on solar lanterns to 5 per cent, the renewable energy sector continues to be a low priority for the government," a statement issued by the Forum for Advancement of Solar Thermal (FAST), an industry association, said.

The solar mission targets 20,000 MW of grid-connected solar power by 2022. This will be produced from two technologies—solar thermal and solar photovoltaic. The budget exempts customs duty on inputs used in solar cells for solar photovoltaic panels, but ignores the solar thermal sector. The budget has also reduced customs duty on solar lantern from 10 per cent to 5 per cent. Solar off-grid industry representatives say these lanterns form a small part of solar off-grid needs.

Additional resource allocation was required to make energy through clean sources accessible in un-electrified households, said Pashupathy Gopalan, managing director of SunEdison Energy, a company that sells solar off-grid products.



SURYA SEN / CSE

The modalities for disbursal of the National Clean Energy Fund announced in the last annual budget have not been notified this year. The fund estimated to be over ₹3,000 crore is based on proceeds from cess of ₹50 per tonne of domestic and imported coal.

"We were expecting some clarity on the clean energy fund. The fund was to be used to support renewable energy technologies. But the modalities are still being internally debated without involving the industry and non-government stakeholders," said Anil Lakhina, chairperson of FAST.

The fund, said a wind energy representative, was hijacked for non-energy purposes. Without deciding its modalities, the budget allocated ₹200 crore for the Green India mission and another ₹200 crore for launching environmental remediation programmes from the Clean Energy Fund.

LED assemblers have welcomed excise duty reduction from 10 per cent to 5 per cent. Its high cost had limited its use in India. Reduction in duty will boost growth of this technology in television sets with LED lights and solar lighting systems that support LED lights, said Sanjeev Kumar, general manager of Surya Roshni, a Delhi-based LED assembling unit. ■

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‘State has tendu trade right’



Expert panel report denies forest dwellers this lucrative right

KUMAR SAMBHAV SHRIVASTAVA

AN EXPERT committee, formed by the Ministry of Panchayati Raj, has recommended that trade control of tendu leaves, critical for forest dwellers’ income, should vest in the state.

The panel, headed by agriculture economist T Haque, was set up to ensure ownership rights of forest dwellers over minor forest produce (MFP) and fix their minimum support price (MSP) in tribal areas.

In its interim report, the committee argued that individual gatherers cannot be given MSP on tendu leaves as they sell only small quantities. It also said it is difficult to give them trade rights as they cannot add value to the produce. At present, tendu leaves are improved in stages by state government agencies.

Giving individuals the right to sell MFP and fixing MSP on them would have substantially improved their financial condition. Almost 275 million people in rural India, a majority of them tribals, depend on MFP.

The Panchayat Extension to Scheduled Areas Act, 1996, and the Forest Rights Act (FRA), 2006, entrust the rights of MFP with the gram sabha and the forest dwellers respectively. But in most states, the government controls the trade of major MFPs such as tendu leaves, sal seeds and mahua flowers. Forest dwellers are mere gatherers. (See ‘Major battle over minor produce’, *Down To Earth*, November 1-15).

The panel was to give its recommendations on bamboo, too, but is divided on the issue. Its final report is expected by March end. Bamboo has not even been recognised as an MFP by states. Formed in August last year, the committee comprises officials from the ministries of environment, tribal affairs and panchayati raj, besides representatives of non-profits.

State forest departments and some official members have opposed giving ownership rights over tendu leaves and bamboo to individual gatherers, a source in the committee said. The lucrative tendu leaves trade forms a major part of a states’ revenue. The Madhya Pradesh government alone earns over ₹200 crore per year from the sale of tendu leaves. Madhya Pradesh, Chhattisgarh, Andhra Pradesh, Odisha and Maharashtra together earn up to ₹82 crore a year from bamboo. The panel has recommended removal of state’s monopoly over trade of all the other MFPs and fixing MSPs for them.

Government controls trade of major MFPs in states. Forest dwellers are mere gatherers

Anil Garg, a Madhya Pradesh-based researcher on tribal issues, argued that government should give up its monopoly over all MFPs since it has to rest with the panchayati raj institutions alone. “Government has no right to decide an issue that comes under the gram sabha’s purview. I do not think it is too difficult to deregularise the trade. A gram sabha or a group of gram sabhas can organise the trade,” he said.

The panel has suggested other states to adopt the trade arrangement of Madhya Pradesh where state agencies sell tendu leaves and give the gatherers wages, bonus and dividends.

Garg, however, picked it apart saying, “The forest corporation is making huge profits from the tendu leaves trade. The model is full of irregularities. The gatherers hardly get their share of profit.” Garg has filed a case before the Lok Ayukta charging the state forest development corporation with depriving forest dwellers of sale profit.

On bamboo, the committee has suggested amending the Indian Forest Act, 1927, to give it MFP status. The FRA describes bamboo as an MFP, but the 1927 Act calls it a tree. The panel has recommended incorporation of the MFP definition in the forest Act and other forest laws.

“Official members on the panel think the gram sabha does not have the technical expertise to harvest bamboo. They are worried that if ownership rights of bamboo are given to forest dwellers, they will destroy the crop,” said the source.

But former tribal welfare commissioner B D Sharma argued tribals are more skilled to harvest forest produce than the forest department. “The forest department can provide technical guidance if the government finds it important, but the ownership of bamboo must rest with the gram sabha,” he said.

Haque and the non-official members are said to be pushing for granting the gram sabha the right over bamboo. ■

Minor forest produce up for sale



SAYANTONI PALCHOUDHURI / CSE

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Panos is an independent non-profit organization specializing in communication

Bamboo sale for bamboo rights

A Maharashtra village demands rights to transport and sell forest produce

APARNA PALLAVI *Gadchiroli, Maharashtra*

MENDHA Lekha village in Gadchiroli district of Maharashtra staged a novel protest on February 15. It organised a bamboo sale in the village to highlight the forest department's refusal to grant transit passes to transport bamboo out of the village for sale.

Mendha Lekha was one of the first two villages in the country to claim community ownership over forests under the Forest Rights Act (FRA) of 2006. But even after claims were issued to the village on August 28, 2009, the department refused to issue passes to transport forest produce out of the village (see 'Forest titles only on paper', *Down to Earth*, May 31, 2010). Not having a pass means the produce would be confiscated at the forest check posts.

Gadchiroli MLA Namdev Usendi was the first client to buy bamboo from the protesters and called up the area's conservator of forests P R Yeole requesting him to issue a transit pass for the bamboo pole he had bought. Many individuals and organisations, including Delhi non-profit Centre for Science and Environment, also purchased bamboo and submitted applications for passes.



APARNA PALLAVI / CSE

Sale was to protest forest department's refusal to issue passes to cart bamboo

Forest rights activist and leader of Mendha Lekha, Devaji Tofa, said the gram sabha had informed the department about the intended protest sale in January. Forest department officials, who had been ignoring the requests for passes for a year, responded by saying harvesting and marketing bamboo is not included in the rights of gram sabhas. It invited the village residents to participate in department-sponsored bamboo felling and accept wages for it, which was the practice before FRA came into effect. In its reply, the gram sabha cited various sections of FRA which grant communities ownership over bamboo and other minor forest produce and said it would go ahead with the protest.

A day before the symbolic protest, an adult member from each of the 83 families in the village felled 83 bamboo poles in coupe number 471 within the village forest limits, due for felling this year. "Forest officials were shooting our bamboo felling activity on camera," said a resident. A sale was organised next afternoon; each pole was priced at ₹25.

When Usendi called up Yeole to request for passes, the conservator of forests refused, saying the Maharashtra government was yet to take a decision on implementing FRA. Usendi countered by saying the timeframe for an independent state forest rights legislation has lapsed and that the Central law is now in force in the state. He said he would move the consumer court and initiate an insubordination motion in the coming Assembly session.

Hirabai Hiralal of Vrikshamitra, a non-profit supporting Mendha Lekha in its fight for forest rights, said the department has still not issued passes. ■

UPDATE

Wildlife habitat rules withdrawn

The Union Ministry of Environment and Forests has withdrawn its latest guidelines for creating inviolate space for wildlife. The decision to withdraw the critical wildlife habitat (CWH) guidelines followed a March 4 meeting between environment minister Jairam Ramesh, non-profits working on tribal rights, wildlife activists and the chief wildlife wardens of states.

The ministry was under fire because the guidelines issued on February 7 did not follow the criteria and procedure for declaring CWH provided in the Forest Rights Act (FRA) of 2006 and threatened the interests of forest dwellers (see 'Misguided rules', *Down To Earth*, March 15, 2011). Ramesh said the ministry will prepare a fresh draft by April-end which will be in consonance with FRA. The new guidelines will be finalised after public consultations. While the objective of the guidelines withdrawn seemed to be relocating people from CWH, the aim of the new guidelines will be to conserve the ecology of such areas, Ramesh said. He also directed National Tiger Conservation Authority to draft new guidelines for declaring tiger reserves and 'implementation protocol' for relocating people from critical tiger habitats in two weeks.

—KUMAR SAMBHAV SHRIVASTAVA



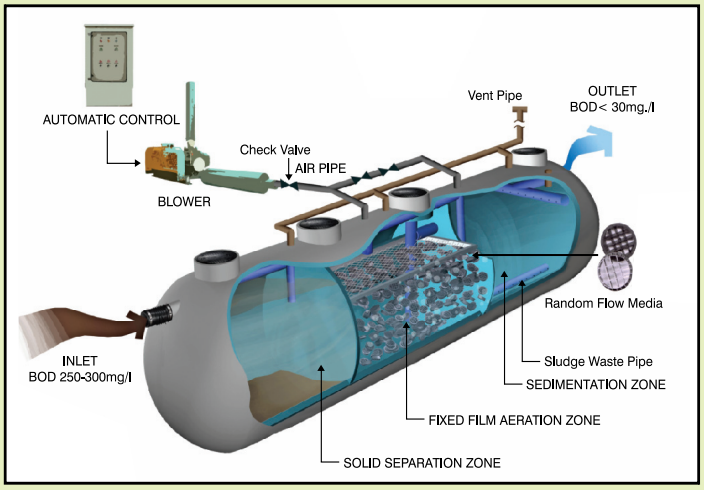
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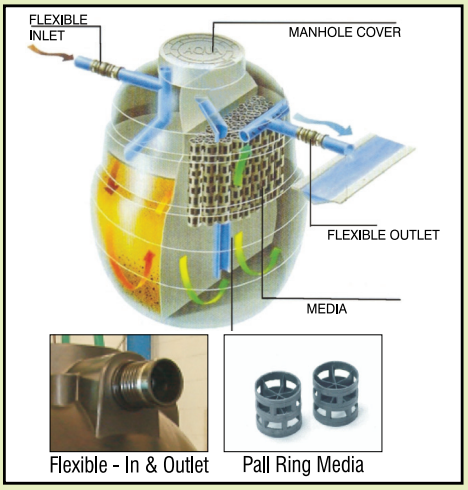
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Bidhan SIL-23/10

Streamlining autonomy

Panchayati raj ministry suggests amendments to local governance in north-eastern states

MOYNA

THE Union ministry of panchayati raj has suggested amendments to streamline local governance in the tribal areas of north-eastern states.

The draft amendments to existing laws governing local bodies in the Sixth Schedule areas would help fight insurgency prevailing in the region and effectively implement Central government programmes, such as the National Rural Employment Guarantee Scheme, at the grassroots level, ministry officials said.

In recent years, several government panels and civil society groups had suggested amending the Constitution to dissolve the autonomy of local bodies in Sixth Schedule areas, following reports of dysfunctional local governance, corruption, siphoning money from state schemes to fund insurgency, exclusion of women and ethnic divides, rendering local governance ineffective.

Instead of amending the Constitution the ministry has now suggested amending laws to make local bodies more powerful and independent.

Broad recommendations

- Constitute village councils uniformly across the region, especially where there are none
- Make village council accountable to people
- Reduce state government control over village and district councils
- Hold elections under the supervision of state election commission every five years
- Set up municipalities as required
- Set up state finance commissions. ADC should have the representation of the finance commission for effective penetration of government schemes like NREGS
- Ensure women's participation and reservation in village and district councils



DIVYA

"An amendment to the Constitution would be an external imposition," said Hrushikesh Panda, additional secretary in the ministry. "These amendments are an attempt to make the process of decentralisation inclusive rather than imposing laws," Panda said. The amendment is also to avoid opposition from tribals who have so far enjoyed certain autonomous powers, he added.

But dissent seems inevitable. Secretary of Khasi Hills District Council, W Syiemlieh, said the Sixth Schedule was inserted in the Constitution to protect the distinct identity, customs and culture of tribals in this region. Any change would be against the Constitution, he said.

Tribal areas of Assam, Meghalaya, Mizoram, Manipur, Nagaland and Tripura follow their traditional way of governance and enjoy a greater autonomy than other regions where panchayati institutions are in place. For instance, local bodies in Sixth Schedule areas have judicial powers to decide dispute as per their customary laws. They also have the the power to decide "any matter relating to village or town administration, including village or town police and public health and sanitation; the appointment or succession of chiefs or headman; the inheritance of property; marriage and divorce and other social customs", as per the Constitution.

Panda and a team of officials from the ministries of home affairs, panchayati raj, urban development and development of north eastern region recently visited several areas in the Northeast to gather public opinion on the draft amendments. Panda said there is not enough effective local governance in the region—neither in the Sixth Schedule nor in non-schedule areas.

North-eastern states have a two-tier system of local governance. One, village council at the grassroots level formed by representatives from each tribal clan in the village as per customary laws. Two, autonomous district councils (ADCs) which comprise elected members from the autonomous district designated by the state governor. But this is not uniform across the region, said Panda. Assam and Meghalaya do not have village councils, whereas Nagaland has no ADC. Women's participation in the governance process is poor. Mizoram, for example, has 3,000 village council members; 30 of them are women. Among all six states, local bodies of Tripura have reservation for women. Assam is the only state with an urban local body, or municipal corporation. In Manipur, no election has taken place for the district council members in the past 20 years.

"Village councils are the most decentralised unit of governance as they include a representative from each clan. But at the same time they are undemocratic in their lack of women's participation," said Walter Fernandes, director of North Eastern Social Research Centre in Guwahati. The laws required in the region need to be more related to the democratisation process, he added.

"As of now, the Central government schemes do not directly come to village councils because they are not elected bodies like the panchayat," said Fernandes. This reduces people's participation as well as limits their benefit from the local governance. According to Fernandes, laws to make these regions democratic are long due but would be completely useless unless the government follows a long engagement with the tribal and community leaders. ■

FULBRIGHT

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Licence revived, production halted

Government-run vaccine units fail to resume supply for immunisation programme

ANKUR PALIWAL

LICENCES of public-sector, vaccine-manufacturing units were restored more than a year ago. But the units are yet to resume supply of vaccines to the Centre's Universal Immunisation Programme, and it will not happen any time soon if one were to believe activists.

The Central Research Institute (CRI) at Kasauli in Himachal Pradesh, the Pasteur Institute of India (PII) at Conoor in Tamil Nadu and BCG Vaccine Laboratory (BCGVL) at Guindy in Chennai were meeting 80 per cent of the vaccine requirement for the government immunisation programme till 2008—the year the Drugs Controller General of India revoked their licences, citing non-compliance with the good manufacturing practices of WHO (see 'Get your own vaccine', *Down To Earth*, July 15, 2009). Since then the government has been procuring the vaccines from private companies at higher prices (see 'Vaccine procurement price').

While CRI officials said they are resuming supply gradually, Union Minister of State for Health Dinesh Trivedi did not specify when it would be resumed by the other two units. He was replying to a question in Parliament on February 25. When CPI(M) member of Parliament T K Rangarajan visited PII and BCGVL facilities recently, he found the two units had not produced a single dose of vaccine for supply since their licences were restored early last year (see 'Vaccine units need booster shots', *Down To Earth*, April 15, 2010).

Start up problems or conspiracy?

When contacted, K N Venkataramana, assistant director of PII, said production had started last year. "But there are some technical glitches. We cannot say when we would be able to supply for the immunisation programme," he said. Rangarajan explained what these glitches meant. "Funds allotted for reviving PII—about ₹140 crore—were not utilised properly leading to problems." PII had produced 51.2 million vaccine doses of which only 250 cleared quality tests, resulting in loss of ₹10 crore, said Rangarajan. He alleged that there is a deliberate attempt not to allow the institute to function. For instance, the director of drugs control at Chennai suspended the production of tissue culture anti-rabies vaccine at the institute in December 2010. The suspension was based on an inspection conducted two years before in January 2008 and did not take cognisance of the fact that the facility had been upgraded since then.

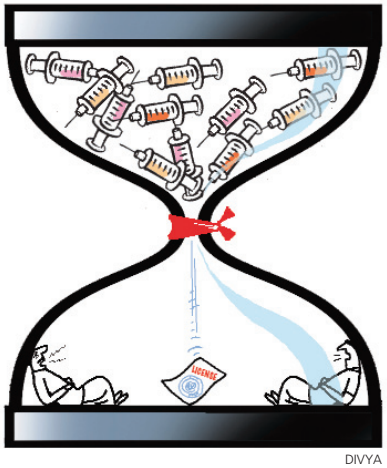
Similar conditions prevail at BCGVL. There was a plan to convert it into a testing laboratory. Now the plan is to reconstruct and upgrade the facility to meet international standards, said a health ministry official. "During my visit, I felt the government was not keen on fast-tracking manufacture of vaccines at BCGVL," said Rangarajan. His claim is reinforced by a recent communication from the Drugs Controller General's office. It ordered production and supply of equipment be stopped with immediate effect in the unit because of some technical snag, said a member of the parliamentary standing committee on health and family welfare. The 43rd report of the parliamentary committee, presented in Rajya Sabha last August, commented on the ministry lacking the will to revive these units.

Sanjai Sharma of the Human Rights Law Network, a collective of lawyers and activists, said there seems to be a "conspiracy between the government and private manufacturers to keep the units crippled forever".

Vaccine procurement price

(in ₹, rate per vial of 10 doses)

Vaccine	2007-08	2008-09	2009-10	2010-11
BCG	13.00	17.50	27.85	28.6
DPT	13.50	14.37-16.88	23.59	23.59
TT	6.20	8.40-11.85	17.69	17.69



DIVYA



During my visit to BCGVL, I felt the government was not keen on fast-tracking manufacture of vaccines

—T K RANGARAJAN
Member of Parliament

'De-licensing decision wrong'

A ministerial committee, headed by former health secretary Javed Chaudhury, had termed the process of de-licensing "extremely unsystematic and scattered". The panel, asked to review the reasons for suspension of licences of the three units, submitted its findings in February last year. The report said there were no quality problems at the units.

Chinu Srinivasan, a public health activist and one of the petitioners in the ongoing Supreme Court case challenging closure of vaccine production facilities, sought criminal prosecution of Anbumani Ramadoss, the former Union health minister in whose tenure the units were closed.

The closure of units has not only doubled government spending on vaccines but has also led to a shortfall of vaccines. The government admitted to a shortfall of 112.2 million doses of vaccine in 2008-2009 and 170 million doses in 2009-2010 for its immunisation programme. The admission was made in December 2010 in response to a Right to Information application filed by K V Babu, an opthalmologist from Kerala. ■

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Act to make Coca-Cola pay

Kerala passes law on tribunal to secure compensation for victims of bottling plant

SAVVY SOUMYA MISRA

JUST before the Kerala Assembly was dissolved for elections, the state's Left Democratic Front government passed a law to secure compensation for people affected by Coca-Cola's bottling operations at Plachimada in Palakkad district.

The law, passed unopposed on February 24, provides for a three-member tribunal which will adjudicate on claims for compensating losses resulting from Coca-Cola's operations, which include groundwater pollution and depletion, loss of agricultural land, loss of jobs and health problems. The tribunal will have powers equal to that of a civil court and can issue summons and examine witnesses.

The Coca-Cola plant was closed in March 2004 following a high court order and protests by Plachimada residents whose wells and ponds went dry. Overextraction of groundwater by the beverage company, Hindustan Coca-Cola Beverage Private Limited, had caused severe environmental and soil degradation. The bottling plant's effluents contaminated water in Perumatty and Pattanchery gram panchayats of Plachimada, leading to skin ailments, breathing problems and debility.



SUCHI PANDE

"The Act reflects the will of the people and it has to be respected. Coca-Cola should now pay the damages voluntarily as part of its social responsibility," said R Ajayan of the citizens' front, Plachimada Solidarity Committee.

Lesson for polluters

The Plachimada Coca-Cola Victims Relief and Compensation Claims Special Tribunal Act is a historic legislation that "sets a precedence for companies that think depletion of natural resources is alright," said S Faizi, environmentalist and member of the Plachimada high-powered committee. The Act is based on the recommendations of the committee, which submitted its report in March last year, holding Coca-Cola responsible for causing pollution and water depletion in Plachimada.

Plachimada high-powered committee had assessed the damage at ₹216 crore

The committee, formed by the state government on the recommendation of the state groundwater board in May 2009, had assessed the damage caused in and around the Plachimada bottling plant at ₹216.26 crore. The committee headed by additional chief secretary K Jayakumar had based its recommendations on the "polluter pays" principle, (see 'Coca-Cola asked to pay Rs 216 crore', *Down To Earth*, April 15, 2010).

The Act now legally binds Coca-Cola to follow the directives of the tribunal. "We also want the government to initiate criminal proceedings against the company," said Ajayan. The high-powered committee report had said that in its four years of operation in Plachimada, the cola plant had violated eight laws, including the Water Act of 1974, the Environment Protection Act of 1986 and the Hazardous Waste (Management and Handling) Rules of 1989. Violation of the laws is sufficient ground to initiate prosecution.

Coca-Cola reviewing options

The beverage company is miffed with the piece of legislation. It called the bill a populist measure cleared in haste on the last day of the Assembly to garner votes in the forthcoming elections.

Activists refuted this. The law should have been passed long ago because the high-powered committee report was submitted in March last year, said C R Bijoy of advocacy group People's Union for Civil Liberties who has been working for the rights of Plachimada victims.

When contacted, a company spokesperson said: "We are disappointed with the bill and the flawed process on which it is based." He said the bill is not based on facts, scientific data, and inputs given by the company. The company was at no point of time "given opportunity to present facts, engaged in dialogue or allowed to share independent data before the Bill was tabled."

The beverage company has refused to acknowledge that its bottling plant harmed village residents. It has questioned the validity of the high-powered committee. The company spokesperson said any government panel should have first determined through scientific study and established process of law, whether any damage was caused to the residents. Second, it should have determined who or what was responsible if such damage was caused, he said.

Jayakumar explained that the mandate of the high-powered committee was not to assess the damage. "The damages were already assessed in earlier reports. We were to quantify the extent of damage and the inter-relatedness of the damage," he said.

The company said it is reviewing all options and is open to discussion with stakeholders. ■

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Blank on target

Most states fail to achieve renewable energy target under the climate change action plan



SAYANTAN BERA / CSE

RUHI KANDHARI

Two states succeeded. Rest did not. The National Action Plan of Climate Change (NAPCC) envisages five per cent of total energy production every year from all states will be from renewable sources. But in the financial year ending March 2010, the achievement was of 3.9 per cent, majority of which came from Tamil Nadu and Karnataka. The gap is likely to increase as NAPCC's target will rise by one per cent annually to touch 15 per cent by 2020.

Launched in 2009, NAPCC outlined existing and future policies addressing climate mitigation. A report issued by the forum of electricity regulators was released following the launch. The report recommended that to be in sync with NAPCC's target, the level of renewable purchase obligation (RPO) to be achieved by all states should be above five per cent by 2010. Set by a state for itself, RPO is the percentage for electricity to be procured from renewable energy sources. Till November 2010, 21 states had specified their RPO capacities.

Tamil Nadu and Karnataka had achieved an RPO level of more than 10 per cent by March 2010, while Punjab, Madhya Pradesh, West Bengal, Uttarakhand, Jharkhand and Bihar could generate less than two per cent.

One of the reasons the target was not met was "electricity is a concurrent subject where states retain the authority to frame policies on renewable energy", said Rakesh Shah, adviser (renewable) with the Central Electricity Regulatory Commission (CERC).

In addition, most states have made achieving RPO nonmandatory by adopting "genuine difficulty" clause mentioned in a model regulation framed by CERC. The regulation states: "In case of 'genuine difficulty' in complying with RPO, the obligated entity can approach the commission for carry forward of compliance requirement to the next year."

High cost of renewable energy, lax rules and less participation could be the cause

High cost of generating renewable energy could also be a reason. "DISCOMs do not want to buy energy from renewable sources because of the high cost. It discourages a state to meet its RPO despite it being mandated by the state," said Ashwin of Prayas, a non-profit on energy research in Pune.

Conventional power costs a state electricity distributor about ₹3 per unit , while wind energy costs about ₹5. Most importantly, NAPCC does not mandate a minimum renewable generation of five per cent by a state.

Despite CERC asking all states to fix RPO for 2009-10 at a minimum of five per cent, many states did not adhere to it. "Even if such reduced RPOs are met, it may not result in NAPCC's target," Shah said. Some states have not even issued RPO orders, he added.

State electricity regulatory commissions have often overestimated their respective state's RPO capacity, pointed out V Subramanian, secretary general of Indian Wind Energy Association.

For example, a 2010 report by Prayas stated that there is a big difference in the estimation of solar energy potential of Odisha by Orissa Renewable Energy Development Agency and non-profit World Institute of Sustainable Energy. The former puts it at 16,230 mega Watt (MW) and the latter at 7,874 MW. "A more accurate renewable energy potential is required for planning future capacity additions," the report stated.

Odisha passed RPO order of three per cent for 2007-08 which was to increase by 0.5 per cent each year to five per cent by 2011-12. But till March 2010, the state generated less than one per cent. Similarly, Madhya Pradesh had fixed RPO of 10 per cent but achieved less than one per cent.

To remove roadblocks in flow of renewable energy from surplus states to the deficit ones, the forum of electricity regulators suggested use of renewable energy certificates. These certificates allow entities to buy energy from generators. One certificate is equivalent to one MW per hour of renewable energy. ■



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Lavasa above law

Developer continues to bypass norms; environment ministry may give clearance to hill city

SAKSHI C DASGUPTA

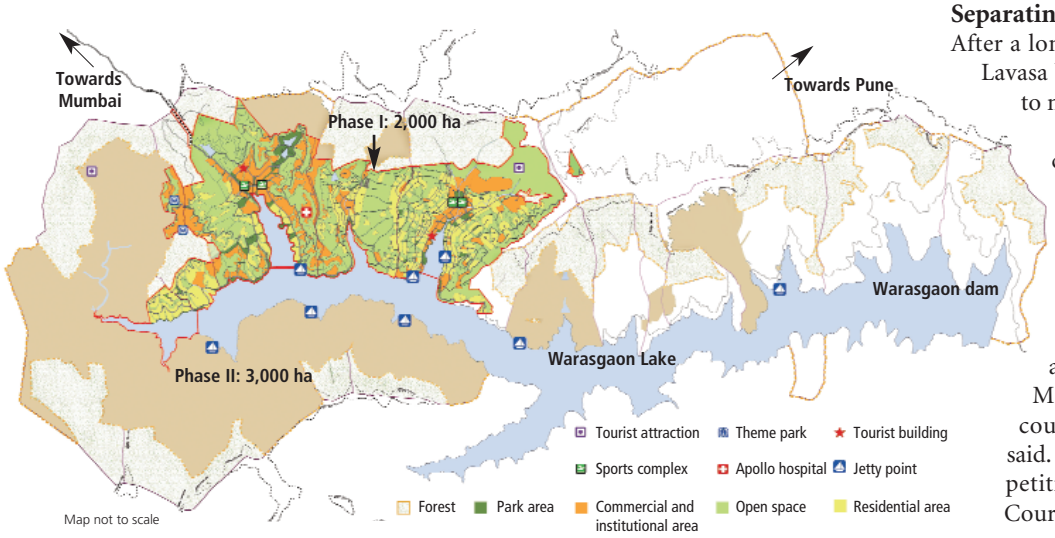
India's maiden planned hill city that made news for bending rules and undertaking unauthorised construction may get the Centre's nod, after all. The buzz is the Union ministry of environment and forests (MOEF) may give conditional clearance to Lavasa, which is being developed in the Western Ghats, 65 km from Pune.

MOEF issued show-cause notice to the project for flouting environmental norms under the Environment Protection Act of 1986 on January 17. It also halted construction at the site till further notice. The project's development has been divided into two phases—2,000 hectares (Phase I) and 3,000 hectares (Phase II).

After receiving the notice, private developer Lavasa Corporation Limited (LCL) sought post-facto environmental clearance for Phase I on the grounds of investing ₹3,000 crore in the project and that it has provided benefits like jobs and better road connectivity to people living near the site. A post-facto clearance, said environmental lawyer Ritwick Dutta, is when a project is granted MOEF's approval after construction has started. "It is an administrative action and has no legal backing. Simply stated, it is legalising illegality," he said. The talk of a post-facto clearance emerged because of a point in the notice: "The MOEF is prepared to *consider* the project on merits with imposition of various terms and conditions, including penalty, environment restoration funds and comprehensive environment impact assessment (EIA) and management plan."

In its defence, LCL said, "work at the site began after we obtained environmental clearance from Maharashtra's environment department in 2004 under Hill Station Development Regulation of 1996". Suniti SR of the activists' coalition National Alliance of People's Movement, which is campaigning against the project, said, "Since then, Lavasa has violated state clearances, and indulged in hill cutting and construction in no-development zones." These accusations were confirmed at the meeting of the MOEF's expert appraisal committee held on February 14-15, 2010.

Visit by the environment ministry's expert appraisal committee confirmed violations by the project



In 2002, state-owned Maharashtra Krishna Valley Development Corporation leased out 141 hectares (ha) to LCL for public purposes like construction of check dams. "LCL used that area for building hotels, residences and malls," noted the minutes of the meeting.

The Pune collector allowed LCL to construct on a plot of one ha in 2007, and 12 ha in 2008; both in Phase I. The building permission was for ground plus one floor. "But Lavasa took liberties and went on to construct up to four-storeyed buildings," said Suniti. In addition, "they followed a uniform floor space index (FSI) for all buildings, even for those in sensitive areas like hill slopes. All this has been possible because of the Maharashtra government's support over the years".

To suit LCL, the state amended the Maharashtra Regional and Town Planning (MRTP) Act of 1966, reducing no construction-zone near a water body from 100 metres to 50 metres. "The company defied this too. It reclaimed parts of land from water and constructed buildings less than 5 metres from water bodies," she said. LCL officials refused to comment saying the matter is sub-judice.

Till date, LCL has completed construction on about 700 ha.

Separating fact from fiction

After a long-drawn movement against Lavasa by many activists, MOEF tried to make up for the lost ground.

In its notice, MOEF categorically dismissed the nod given to LCL by Maharashtra, saying a state environment department has no delegated powers to give a clearance. Only the state environment impact assessment authority (SEIAA) for Maharashtra, set up in 2008, could give clearance, the MOEF said. On January 24, Lavasa filed a petition in the Bombay High Court challenging MOEF's order to








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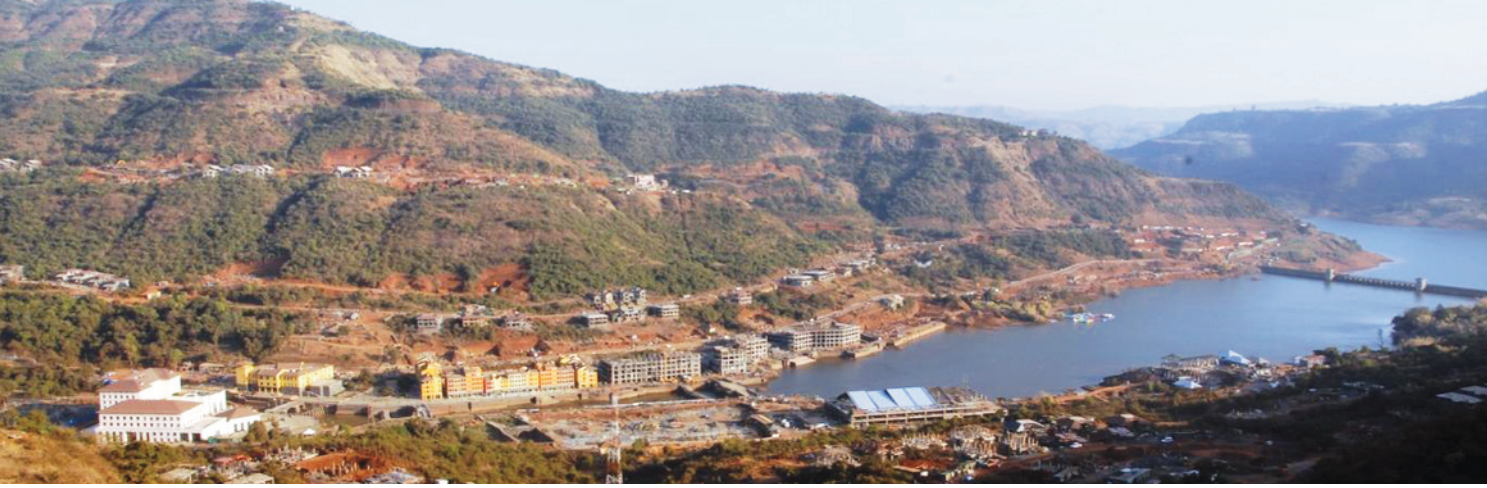
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LCL

stop work (see 'Bombay high court gives six weeks' time to Lavasa', *Down To Earth*, February 16-28, 2011). The court did not overturn MoEF order and directed the ministry's expert appraisal committee to visit the project site. The inspection exposed LCL's misconduct.

A hospital in the planned hill city had no effluent-treatment facility for its liquid waste, violating conditions of the Maharashtra Pollution Control Board, the committee report stated. Roads and buildings at the site were constructed on steep gradient, increasing risk of landslides. Impacts of construction activities alongside Warasgaon Lake, which flows through Lavasa, and its downstream flow to Pune were not properly assessed by LCL in its reports. "Such activities would affect quality of water and its supply to Pune and agricultural fields downstream," Suniti said.

The report also stated the entire project stands on an area originally earmarked for afforestation under Pune regional plan 2001.

LCL has published three reports, two EIA reports in 2004 and 2011, and a post project monitoring report in 2008. They were prepared by government-funded National Environmental Engineering Research Institute (NEERI) in Nagpur. While the 2004 and 2008 reports showed presence of heavy metals, like cadmium and nickel, in groundwater, the 2011 report noted it as non-detectable, showed the minutes of the expert appraisal committee's meeting. According to the 2003 and 2008 amendments of Hazardous Wastes Rules, presence of heavy metals in soil makes it unsuitable for construction. The 2008 report showed high lead concentration in surface water—0.2 milligramme per litre, five times higher than the ISI drinking water standards.

The minutes highlighted discrepancies in the 2011 report between estimated discharge of sewage from the project area (20 million litres per day for Phase I) and the amount for which LCL sought consent from the pollution board (9 million litres per day).

Further, Lavasa's environment management plan ignored key recommendations of the 2004 EIA report that asked for mapping of slopes, their classification and vulnerability to soil erosion.

Tainted track record

1996: Special regulations under Maharashtra Regional and Town Panning (MRTP) Act of 1966 introduced. They empower state to declare any suitable area hill station and award it to a private developer

2001: State chooses Lavasa Corporation Limited (LCL) for Lavasa

2004: Maharashtra environment department issues clearance to the project

2005: State pollution board gives green signal to the project

2007: Amendment of MRTP by state allows construction on specified slopes and relaxes norms for buildings

2008: Maharashtra declares LCL special planning authority. State environment impact assessment authority (SEIAA) of Maharashtra constituted

2009: LCL submits proposal to SEIAA for clearance. Clearance pending

2010/11: MoEF investigation brings Lavasa under scrutiny

Fix loopholes

The controversy has brought under scanner the effectiveness of EIA, the most critical tool for regulating developmental process, pointed out Dutta. "The main reason LCL got away despite violating various laws is the weak EIA process in India," he said. Simplified EIA rules for construction projects have added to the problem. According to the EIA notification 1994, all projects above 1,000 metres in altitude and requiring investment of more than ₹5 crore need to apply for an environmental clearance. "Lavasa did not apply for the clearance because its development was between 600-900 metres, and it was approved by the state," said Arun Bodupali, senior vice-president, legal, LCL. But the investment was above ₹5 crore, he admitted.

Even the EIA notification of 2006 has many loopholes, Dutta pointed out. It sets 20,000 sq m as the lower limit for obtaining an environmental clearance. In order to bypass this requirement, several proponents, like LCL, develop their project in smaller phases. Moreover, there is no provision for public consultation in the process of giving an environmental clearance for buildings and townships, Suniti said. "This was a major reason irregularities and violations by both Lavasa and the state government went almost unnoticed."

Dutta added that the authorities' focus should shift from area to ecology. "A project spread over less than 20,000 sq m can be potentially more damaging than a project bigger than this depending on the ecological sensitivity of the location. Like in the case of Lavasa, which is near Western Ghats," Dutta said.

If given the post-facto clearance, Lavasa will set precedence of legitimising projects that have no prior or proper EIA. "It is not a new phenomenon," said Kanchi Kohli of Kalpavriksh, an environmental action group. "It is just that it has become more open now."

A case in point is the Mundra port and SEZ project in Gujarat that was granted post-facto clearance in 2009. ■

With inputs from Arun Bhandari

phf Paul Hamlyn Foundation

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Paan loses flavour

Iconic *paan* no more appeals to farmers, traders and common people. They say the contagious spread of chewing tobacco, especially *gutkha*, is fast taking over the *paan* market. Farmers have more reasons to shy away from the crop once referred to as green gold. Skyrocketing input costs, water scarcity and unpredictable weather mean betel gardens are no more lucrative.

Richard Mahapatra, Sayantan Bera and **Moyna** travelled to betel leaf gardens of Uttar Pradesh, West Bengal, Odisha and Delhi and visited *paan* markets to understand the fate of the cash crop considered ideal for small farmers

The way *paan* is associated with India, a Chaurasia is associated with *paan*. But both the equations are changing, said Lalta Prasad Chaurasia, spitting blood red betel juice into an elegantly designed brass spittoon. The 58-year-old is among the last generation of Chaurasia farmers in Mahoba district of Uttar Pradesh who have witnessed betel leaves yield a fortune. Both betel leaves and the Chaurasias are an integral part of Mahoba's history. The district is known for its betel gardens and the Chaurasias are India's exclusive community devoted to betel farming. But they are now finding it difficult to sustain the family occupation.

Till a decade ago, Lalta Prasad's betel gardens extended over a hectare

Mukund Chaurasia is among the 200-odd farmers of Mahoba who still grow betel vine. The Chaurasias are the exclusive community devoted to betel farming. In the past decade over 500 Chaurasias in the district have quit the family occupation



VAIBHAV RAGHUNANDAN / CSE

(ha). Now his son grows the vine on just a third of the farm. Kamlesh Chaurasia, another young farmer in Mahoba, has reduced his farm size to a decimal (0.004 ha) from nearly a hectare of betel garden he inherited a decade ago. "It is difficult to manage even this small patch," he said. The region is suffering from seven years of drought.

Betel leaf cultivation requires regular watering: four times a day in summer and twice a week in winters. So the gardens are traditionally situated near water sources. But the prolonged drought has dried up most ponds and dug wells in Mahoba. Every day Kamlesh walks about 50 times to a nearby drain to fetch water in a vessel to irrigate his farm. "I can't afford a diesel pump or labourers. But I have to depend on the farm as it gives me some income throughout the year," said Kamlesh who earns about ₹400 a month. "Sticking to betel leaf will not be a good idea. As such, fewer people consume *paan* these days."

Once every three days, Kamlesh plucks tender betel leaves from his garden, neatly stacks them in a basket and takes them to a 200-year-old *paan mandi* (betel leaf hub) in the district headquarters. It is called Paan Bazaar.

Till a decade ago, as many as 100 traders from across the country would visit the Paan Bazaar every day to bid for the famous Mahoba *paan*. But over the years the hustle and bustle has died down. The godown built to store betel leaves is in ruins. The *paan* shops around are mostly owned by people who have abandoned betel farming. But more than *paan* they sell *gutkha*, a concoction of areca nuts, tobacco, lime and flavours. In 2005, the local betel leaf traders' association decided to trade only thrice a week. "Since betel leaf cultivation has drastically come down, there was no need for a regular market," said Rakesh Chaurasia, a member of the association. The market is now called *subzi* (vegetable) market.

Betel cultivation is declining in the state, said D S Yadav, district horticulture officer of Mahoba. Uttar Pradesh is the largest consumer of *paan* and 15 districts grow the vine on 2,000-2,200 ha. In Mahoba alone, Yadav said, 800 farmers were growing betel on 180 ha in 2000. Just 234 are growing the vine on 80 ha this year. In Lalitpur district, the



SAYANTONI PALCHOUDHURI / CSE

Short biography of *paan*

***Paan*, for Indians, is more than just an assortment of betel leaf, areca nut, lime and catechu and other spices. It is a symbol of purity and prosperity. It is used in many rituals, especially those related to marriage. Guest treatment is incomplete without it. Researchers say *paan* is the favourite pastime of 15-20 million Indians.**

Some 40 of the 100-odd betel varieties found in the world are grown in the country. More than 25,000 million leaves are produced every year on 40,000 ha of farms across the country, barring a few northern and north-eastern states.

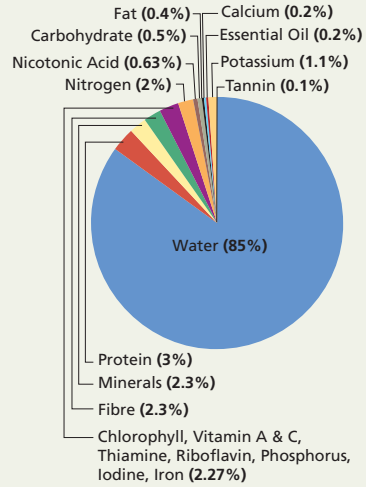
Its use in India dates back to 400 BC. As per ancient books of Ayurveda, *Charaka*, *Sushruta Samhitas* and *Kashyapa Bhojanakalpa*, the practice of chewing betel leaves after meals became common between 75 AD and 300 AD. Towards the 13th century, European traveller Marco Polo recorded, betel chewing among kings and nobles in India. Over the period revenue distribution systems were introduced to support *paan* expenses of the royalty. French traveller Niccolao Manucci referred to Mughal emperor Shah Jahan allocating the revenue of Surat for meeting the *paan* expenses of his daughter. Ahom monarchs, who ruled Assam till the 19th century, created a band of specialised servants for preparing *paan* for kings and their visitors.

With the passing of time *paan* became an integral part of the Indian culture. Traditionally consumed to aid digestion and as a coolant, betel is known to have 50 medical uses. Till 2010, nine patents had been granted for its properties to treat ailments like leukaemia, diabetes and kala-azar.

Though its cultivation is confined to tropic and subtropic areas in South and Southeast Asia and Africa, its appreciators are spread all over the world. Nearly 600 million people worldwide consume *paan* every day.

Last year, India exported betel to 28 countries. Pakistan is the biggest importer of Indian betel. It is said a betel leaf trader in Kerala is more worried about the Indo-Pak relation than the spat between the state's Communist Party and the Congress Party at the Centre. But in the past five years betel exports to Pakistan have dipped by half.

Nutritional composition



area under betel leaves has decreased by 20 ha in the past one year. "The continuous decline is due to several reasons beginning with extreme weather and shortage of water," said Yadav. For instance, the sudden dip in temperatures between January 1 and 12 this year ruined over 80 per cent betel vines in Mahoba. Officials said the area under betel cultivation is set to shrink further because farmers are now left with very few cuttings to begin a new crop. Once planted, the perennial crop can be harvested for four-five years.

The trend of chewing *gutkha* has also influenced the fall in demand and cultivation of *paan*, Yadav added.

Chaurasia's Odisha venture

Betel leaf is not losing its charm for farmers in Uttar Pradesh alone. A few hundred kilometers away, another Chaurasia has severed his traditional link with betel leaves. Guruprasad Chaurasia's father had left his ancestral home in Gorakhpur in Uttar Pradesh in the 1950s to make a career in the booming betel leaf trade. Jaleshwar town in Balasore district of Odisha gave him a head start. But within a generation, Guruprasad is out of the family trade. He now repairs televisions and runs a grocery store.

Till a decade ago, Guruprasad recalled, scores of supply agents would procure the Jagannathi *patta* (leaf) from farmers in Jaleswar and supply to *paan mandis* in Lucknow, Varanasi, Mumbai and Delhi. The supple variety of betel is grown on the sandy soil of Odisha within half a kilometre from the coast. Its cultivation was strengthened by the arrival of businessmen like Guruprasad's father from Uttar Pradesh in the 1950s. During the mid-1980s, a family could earn as much as ₹20,000 a month from a three decimal farm, or *baraj* as it is called after the migrant Barajia community from West Bengal who introduced betel cultivation in Odisha. That was the time when even fishers set up betel farms in their homestead land. About 3,000 baskets, each stacked with 2,000 leaves, were traded daily in the entire Jaleswar town, recalled Guruprasad. Unsure of prices, agents now hesitate to send even 50 baskets, he added.

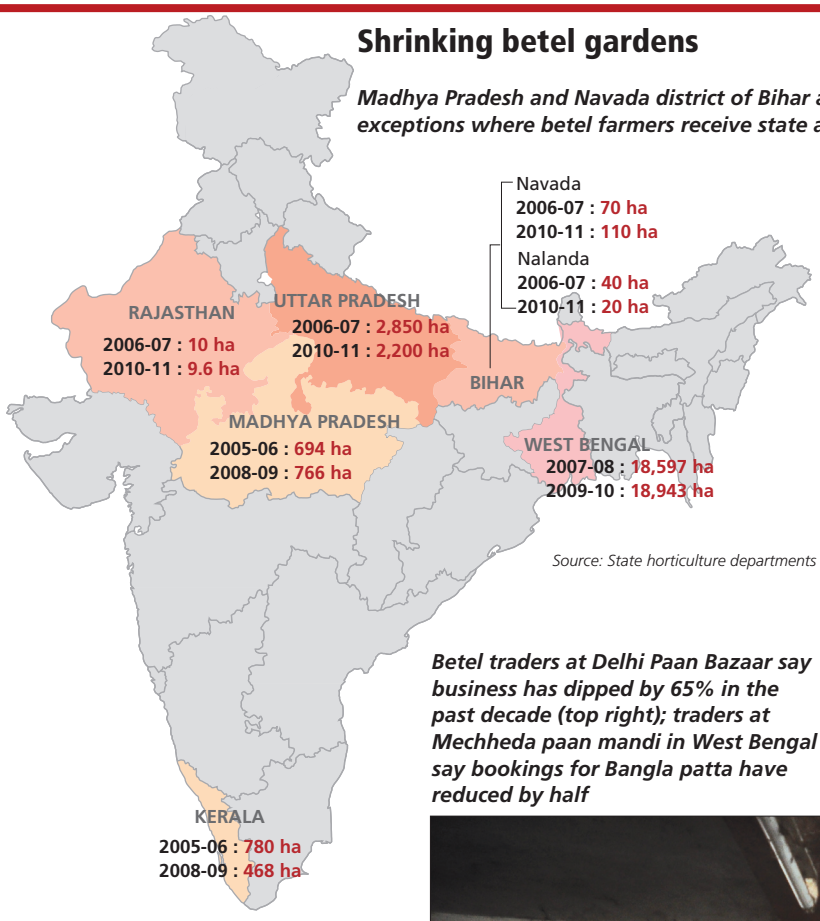
"Prices nosedived in the past couple of years. I incurred a loss of ₹2 lakh in 2008 and have since shifted to a *pucca* (proper) business. It's no longer fashionable to chew *paan*. The young generation likes *gutkha* and cigarette," Guruprasad said, artfully tucking a *paan* in his cheeks.

Guruprasad is not the only victim of the shrinking market. In 1990 more than 200 supply agents were operating out of Jaleswar. Only 15 are still in the business. They have mostly confined their business to the processed form of betel leaf, called the Banarasi *patta*. It commands a high price in the market.

Processing the Banarasi *patta* is a delicate task. One has to neatly pack the leaves in a cane basket after a generous sprinkling of water and cover them with wet jute bags. The basket is then put in

Shrinking betel gardens

Madhya Pradesh and Navada district of Bihar are exceptions where betel farmers receive state aid



Source: State horticulture departments

'Hardly any farmer in the block has set up a new betel farm in the past few years'

—Balai Mohanty, betel farmer, Bhograi block, Balasore

Betel traders at Delhi Paan Bazaar say business has dipped by 65% in the past decade (top right); traders at Mechheda paan mandi in West Bengal say bookings for Bangla patta have reduced by half



SAYANTAN BERA / CSE



SAYANTONI PALCHOUDHURI / CSE

an oven with charcoal burning in one corner. This is called *paan bhatti*. As heat de-humidifies the leaves after three rounds of heating and cooling, they turn pale yellow and thin. They last longer, for up to a month. The processing also imparts a sweet taste, making it a favourite among connoisseurs. Declining betel demand has also affected the processing units. Barely five of the 100 *paan bhatti*s in the town are operational.

Afsin Ali, 40, is one of those who burnt their fingers in the processing business. In 2007, he invested ₹5 lakh from his hard-earned savings and borrowed from betel farmers to set up a *paan bhatti*. He made a profit of ₹1 lakh in the first year. But the market crashed during the summer of 2009. "Since production goes up during summer, the market usually slumps. But that year it was unpredictably steep," said Ali. He received only ₹5,000 for the ₹40,000 worth of consignment he had sent to *paan mandis* in Uttar Pradesh. At times the consignment would rot and he would have to shell out ₹1,000 to dispose it of at a garbage dump. Last year, he gave up the business and started working as an insurance agent.

The horticulture department of Odisha has no records of betel leaf production and trade in the state. However, Balai Mohanty, a betel farmer from Bhograi block in Balasore district, said those who have betel farms are sticking to them as market price is sufficient to meet the running cost. But hardly any farmer in the block has put up a new farm in the past few years, he added. "Betel is not as lucrative as it used to be."



No buzz in *mandis*

Wholesale *paan* markets across Uttar Pradesh, West Bengal and Delhi retell the story of India's diminishing status as the largest betel leaf producer and consumer.

Take West Bengal that accounts for two-thirds of the betel production in the country. Its Bangla *patta* is famous for the spicy taste and is in demand from several Asian countries, including Bangladesh. But bookings for Bangla *patta* have gone down by half in the past 10 years, said Chandi Charan Samanta, secretary of the traders' association of the auction hub of Mechheda in East Midnapore district. Earlier, traders from Delhi and Mumbai would book consignments every day. But these days they make bookings on alternate days and at times even twice a week, Samanta added.

Rajeev Goel, member of the Delhi *paan* traders' association, offered a few figures. Till 1998, the Delhi Paan Bazaar, that supplies betel leaves to the entire city, received 8,000-10,000 Banarasi *patta* baskets every day, each carrying 1,000 leaves. By 2005, the market received 9,000 baskets only five days a week. The number has decreased further to 8,000 thrice a week since 2008.

Betel trade has fallen by 35 per cent in Uttar Pradesh, reckon traders' associations in Lucknow. The district has the second-largest betel market in the country after Varanasi. Farmers prefer to grow crops that give assured returns, said Shyam Prasad Chaurasia, owner of the *paan mandi* in Lucknow. At least

200 farmers who used sell betel leaves at his *mandi* have shifted to other trades in recent years.

Blame it on *gutkha*

As per the Economic Survey of India, about ₹800 crore worth betel leaves were traded in 2000. The trade has dipped by 40-50 per cent since, say traders' associations of Uttar Pradesh, West Bengal, Odisha and Delhi, though there is no official record. "Data on betel is not collected as it falls in the unorganised sector," said Jose Samuel, chief consultatnt at National Horticulture Mission, Delhi.

Last decade is also the period when India witnessed a sharp increase in the consumption of chewing tobacco, especially *gutkha*. According to Euromonitor International, a London-based market research firm, 484,000 tonnes of chewing tobacco was sold in 2004. The sale went up to 639,000 tonnes in 2009. Break down the amount into six grammes, which is the standard weight of a tobacco sachet, and India consumed 80 billion tobacco sachets in 2004 and 120 billion in 2009. According to WHO, 45 per cent adult Indians were hooked to smokeless tobacco consumption in 2009.

Gutkha invaded the Indian market in the 1990s. At roadside kiosks it is as ubiquitous as tea. The success of the ₹10,000-crore *gutkha* industry is due to its easy availability, smart packaging, high shelf-life and low prices; the rate of a sachet has been ₹1 over the past 10 years. Besides, *paan* is a varying commodity, while *gutkha* has a uniform taste, said Subhash Gupta. Once a *paan* seller, Gupta now sells *gutkha* in Delhi's Paan Bazaar. As many as 80 *paan* sellers in the market have shifted to selling *gutkha* in the past decade.

Retailers say it is easy for a bus driver or labourer to pick up 20 sachets on the go. To pick up 20 quids of *paan* they would have to wait for at least 10 minutes while the leaves are washed, garnished and rolled. Satish Kumar, who has been running a *paan* kiosk in Lucknow town for more than 20 years, said 12 years ago he used to sell over 400 betel quids in a day. "These days people hardly ask for betel quids, so I started selling *gutkha* alongside *paan*. I sell at least 100 packets of *gutkha* a day, each containing 60-100 sachets," Kumar said. "People prefer *gutkha* because it is cheaper and more fashionable than red-stained lips."

Too costly to grow

High input cost and erratic weather take toll

Betel leaves were once dubbed green gold. But farmers do not find betel farming lucrative anymore. Besides low demand, it is the rising input cost, primarily for irrigation, that is discouraging betel farmers.

Since it is a tropical plant, growing betel in the subtropic climate of India requires extra care and attention. So farmers grow it in a greenhouse where they can maintain humidity of 40-80 per cent, and temperature between 15°C and 40°C. The greenhouse, which looks like a rectangular hut, is typically made up of bamboo and cane or covered from all sides by mats of dried coconut leaves. The roofing is of hay, dried grass and coconut leaves. Inside the enclosure, rows of thin bamboo or jute sticks are placed, usually a foot apart, each offering support to a single vine. As it grows, it is entwined on the stick. To keep the sand moist and maintain the inside temperature and humidity, farmers need to sprinkle water regularly, at least four times a day in the summer and twice a week in winters.

Farmers say the cost involved in watering has become a major hurdle in betel farming lately. "Earlier, water was not a cost to bother as it was available year round," said Lalta Prasad Chaurasia of Mahoba. His son spends ₹30,000 a year to water an acre (0.4 ha) of farm.

With rainfall becoming increasingly erratic, ponds do not hold sufficient water all year round, said Balai Mohanty, a betel farmer from Bhograi. In summer he depends on borewells, as deep as 12 metres, to water his two farms of 12 decimals each. This pushes up the diesel cost. Betel farmers in Jaleshwar estimate watering accounts for 20-30 per cent of the total cost (see tables).

Betel is vulnerable to even the slight-



SAYANTAN BERA / CSE

Betel is vulnerable to weather changes

Cost of setting up a betel garden

Items (for 10 decimal or 0.004 ha)	Costs in 2000 (₹)	Costs in 2010 (₹)
Soil for elevation (2 ft high from ground to prevent submergence)	500	2,000
Bamboo and other grass for the outside structure	5,500	17,500
Organic fertilisers and pesticides	500	1,000
Chemical fertilisers and pesticides	2,500	5,000
Stem cuttings of betel for plant propagation	4,500	15,000
Stick on which the plant climbs	2,000	4,500
Pumpset for water supply from nearby sources	7,000	15,000
Labour costs	4,000	15,000
Total initial investment	**26,500**	**75,000**



est weather change. "*Paan* cannot be harvested if temperature goes beyond 40°C," said Santanu Patra, owner of Subarnarekha, an agri-marketing company in Balasore, adding, "15 years ago the maximum temperature in Odisha would be 35°C. But last year it touched 42°C. Betel leaves turned yellow and dropped prematurely." Rainfall is no longer uniformly distributed. Patra said in five days Balasore receives rains that should have been spread over two months. "The resultant water-logging can perish the garden in four-five days."

Recent increase in the cost of labour and farm inputs has added to betel farmers' woes. For instance, to put up a betel greenhouse, a farmer needs stacks of bamboo sticks. Earlier, state governments used to provide bamboo at subsidised rates. But the practice has stopped in most states. Farmers say buying bamboo from the market costs them three-four times the subsidised price. Besides, they are not always available in the market. Other raw materials like cane and jute sticks have also become scarce and hence expensive. Betel farmers of Jaleshwar estimate the cost of constructing a betel garden has increased by more than three times in the past decade—from ₹5,500 to ₹17,500.

Add the increased cost of labour to this. Betel cultivation is labour-inten-

Running and maintenance cost

Items (for 10 decimal)	Costs in 2000 (₹)	Costs in 2010 (₹)
Climbing sticks replaced every 3 months	1,500	4,000
Fertiliser, pesticides, fungicides and hormones	500	1,000
Repairing outside structure	300	1,000
Labour cost every 3 months (2 labours twice a week @ ₹150 per day)	2,000	7,500
Diesel cost for three months	400	1,000
Total cost of maintenance	**4,700**	**14,500**

Average annual income

For 10 decimal	Profits 2000 (₹)	Profits 2010 (₹)
First harvest in 3 months	1,500-3,000	2,000-4,000
Subsequently, every 2 weeks	1,500-3,000	2,000-4,000
Average annual income	**36,000-72,000**	**48,000-96,000**

Note: All calculations done according to farmers in Jaleswar, Balasore district, Odisha

sive. A betel leaf garden requires frequent watering, plucking of leaves, applying fertilisers and pesticides and maintenance of the enclosure.

From organic to chemical

Low demand and high-input costs are already driving betel farmers to switch from organic manure to chemical fertilisers and growth hormones.

Farmers from Khejuri block of East Midnapore say using organic manure, usually a concoction of cow dung, vermin compost and oil cakes of mustard, groundnut and neem seeds, costs them ₹36,000 per acre (0.4ha). Chemical fertilisers bring down the cost by less than half. It also helps them harvest the first batch of leaves within a month of setting up the garden instead of two-three months. Weekly plucking goes up from twice to three times. Most betel farmers in West Bengal shifted from organic to chemical fertilisers after cyclone Aila ravaged betel producing districts of East Midnapore and 24 Parganas in 2009.

Heavy downpour and gusty winds brought by Aila destroyed most betel gardens. A basket of 20,000 leaves, which would have otherwise sold at ₹8,000-₹12,000, sold for ₹40,000 once trading resumed, recalled Nadu Gopal Das, a betel farmer from Khejuri. Farmers, who were rebuilding gardens, started using chemical fertilisers profusely to forge a profit from the high price.

> ***'Betel is a suitable cash crop for small farmers, despite high input requirement'***
>
> **—P Guha, IIT Kharagpur**

But parting with organic method has proved to be a loss-making path. Traders at Mechheda auction hub complain the quality and longevity of the pungent Bangla *patta* has reduced lately. According to trade association member Chandi Charan Samanta, "With organic cultivation betel leaves stay fresh for almost 15 days. But with more use of chemicals they are turning yellow in just seven days. This is the reason a basket of 20,000 organic leaves can command a whopping ₹51,000 compared to the chemical variety that hardly fetches ₹19,000." Still most farmers are opting for cheap chemical farming because it helps them quickly recover the high initial investment and minimise the loss in case of a slump in the market.

Support for 'family bank'

Farmers say the government needs to recognise betel leaves as an important trading commodity and offer them support. "It is true we do not pay taxes like the tobacco industry producing *gutkha*, said Veer Kumar Chaurasiya of Lucknow. "But if we are given a little support in terms of insurance or infrastructure betel leaf trade will flourish and we will be willing to pay taxes as required."

D V Amla, deputy director of the National Botanical Research Institute (NBRI) in Lucknow, said in 1981 the institute worked with Mahoba farmers on a government-sponsored project to improve betel leaf cultivation. They had offered suggestions like using plastic sheets instead of thatched roofs. But the government scrapped the project due to shortage of funds in 2000.

In February this year, the state horticulture department submitted a proposal to improve betel cultivation. It has sought ₹15 crore as financial assistance to betel farmers in Uttar Pradesh. Till date, Madhya Pradesh and Bihar are the only states offering financial assistance to betel farmers. Madhya Pradesh offers ₹30,000 or half of the cost of setting up a farm to each betel farmer and is sponsoring a betel vine project. The impact is evident. Area under betel has gone up from 694 ha to 766 ha in five years. In Bihar's Navada district, the horticulture department has been disbursing ₹15,000 per half-a-decimal farm since 2008-09. Area under cultivation has since increased by 40 ha (see map on p32).

P Guha, professor of agriculture and food engineering at IIT Kharagpur, West Bengal, considers betel a suitable cash crop for small farmers, despite high input needs. One can set up a betel garden on a three decimal area. A farm of 10-15 decimals can provide considerable net profit for a family of five, that too for 10 to 30 years, as per Guha, one of the few researchers in India who have studied the crop and its productivity. He calls betel farms household banks.

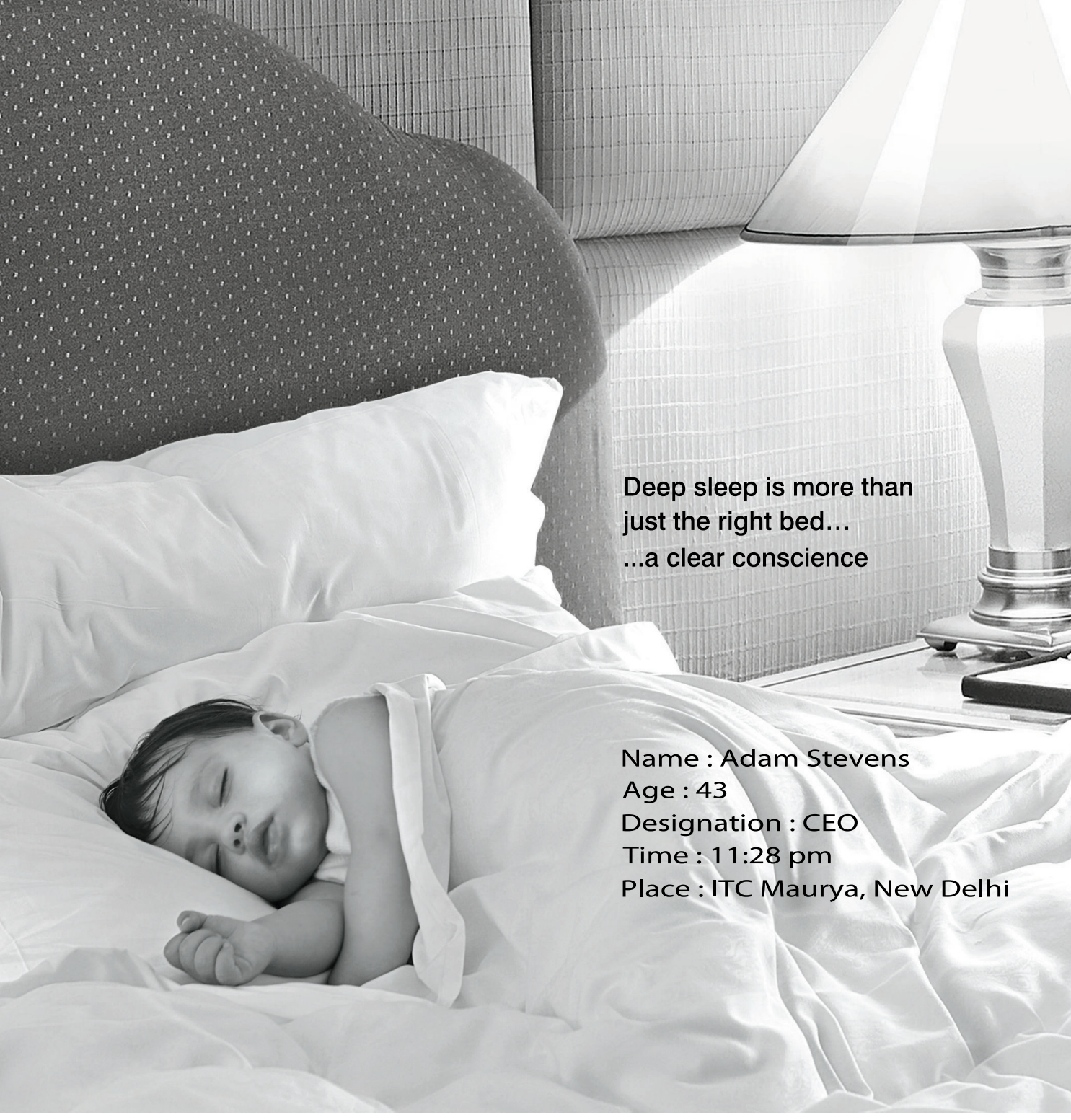
Although betel cultivation began in India 1,500 years ago, the country has not improved the cultivation technique since, nor identified its industrial uses, said Nikhil Kumar, retired scientist with NBRI. According to Kumar, the decreasing popularity of betel is the direct result of looking at the commodity based on its misuses and not its uses. "The first image that comes to our mind when we think of betel is the red spit and stains. But there is more to it. It has been scientifically proven that chewing of betel leaf releases adrenalin thus making the mind instantaneously alert," said Kumar. ■

Vine guards of Odisha

Betel farmers of Odisha are known to engage in protracted struggles whenever their betel vines are threatened.

In 1985, Balasore district saw the beginning of a movement led by betel farmers against the National Missile Testing Range proposed at Baliapal and Bhograi blocks. The government wanted to acquire 10,200 ha farmland that harbours the famous Jagannathi *patta*. The residents erected barricades and blocked entry of officials. The government shelved the project for the time being. Four years later, it again tried to acquire the area. About 8,000-strong police and paramilitary force marched to the blocks. Confronted by women and children, they withdrew. Eventually the project was shifted to Chandipur.

For the past six years, betel farmers are leading another such protest against South Korean giant POSCO's steel plant project in Jagatsinghpur district. It will affect 22,000 people in Dhinkia and Gada Kujanga panchayats who depend on fishing, cashew plants, paddy fields and betel vines. The region boasts a light yellow, mild-in-taste betel variety, Kujanga *patta* and has over 400 betel gardens. Estimates show the total betel leaf business in the region could be worth ₹8-10 crore a year. Small wonder the betel farmers rejected the government's compensation of ₹11.5 lakh per acre (0.4 ha), saying the vines offer much better economic support.



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DAYAMANI BARLA

Residents of Jabra village hold protest march demanding their land rights

Secret dam

People were not consulted, officials say they don't know about it

MOYNA

It took the Jharkhand government a murder, an abduction and angry protests to stop construction of a dam that began in a tribal heartland without informing people whose land was acquired.

The dam will submerge 365 hectares (ha) of about 100 families. As per rules, any acquisition is preceded by a land survey by the authorities, notification to people who may get affected and finally, fix the compensation amount. People can place their grievances once notified about it. The gram sabha of Jabra, a tribal village, must also give its assent for the dam's construction. But the government did not attempt to get any.

The authorities approved construction of a dam on the Chata river at Jabra village in Karra block of Khunti district. But Triveni Engicons Private Limited, the company that bagged the tender, did not follow procedures before starting the project. Unsuspecting people got a rude shock on December 10, 2010, when they saw vehicles driving onto their land and contractors performing *bhoomi pujan,* a ceremony that marks the beginning of a construction. Soon, heavy machines trooped in and construction began.

Angry over forced acquisition of their land, people staged several protests. What followed next was arrests by the police and abduction of two persons. Bindyachal Gupta, a contractor's workman, was released the next day, while Bijay Dhan, a Jabra resident, was found dead. That's when government decided to stop civil work.

"The problem is that contractors started work without taking people into confidence," said Khunti district collector Rakesh Kumar. "They tried to get their work done without following procedures. Work should not have started as the revenue department's land acquisition cell has not conducted survey," he added.



Any acquisition must be preceded by land survey and notification to people. Neither was done

When activist and freelance journalist Dayamani Barla raised the issue with the Block Development Officer, he said he had no clue about the project. Replying to a Right To Information (RTI) query in February 2011, the water resources department said the project did not fall under its purview. In a letter dated August 29, 2008, the department granted Triveni Engicons permission to start construction.

Barla, who also runs a non-profit Dam Prabhavit Sangharsh Samiti, filed three more RTI applications—with the state water resources department, its Khunti district office, and the land acquisition cell of the revenue department. All three replied the project was not under their purview.

This medium irrigation project aims to provide water to 24 villages. The 12-metre high dam would irrigate 3,062 ha of kharif crop and 1,924 ha of rabi crop.

To facilitate its work, Triveni Engicons on its own compensated the affected villagers, said Govind Agarwal, managing director of the construction company. "A lot of noise is being created because activists are now involved in it. The land is barren. Only a few hectares (6-8 ha) that will be taken for canal construction is fertile," he added. Further, the company has been conducting surveys for the past one-and-a-half years and people know about the project, he claimed.

Residents of Jabra, however, deny this. "No family was informed about the proposed acquisition of land. We want government's intervention, else we will fight for our land. The forceful acquisition will leave several families landless and hungry," said Anil Dhan of Jabra village.

Staging protests, residents refused entry to revenue department officials thrice when they went for the survey—on February 10, 11 and 12.

On February 25, they submitted a memorandum to the district collector, who assured them that their grievances would be addressed. ■

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Many a slip

Can India meet the 2012 deadline to provide safe drinking water to all rural homes?

SARANDHA

In many Indian villages, women and children spend a large part of the day fetching water over long distances. This is despite the Centre's policy to provide drinking water to all rural habitations. The government set deadlines for providing 100 per cent drinking water cover to the country's 1.6 million rural households thrice—1997, 2007 and 2009—but missed them. Worse, habitations "fully covered" by drinking water supply networks slipped to "partially covered" or "uncovered" status.

Rowty village in Madhya Pradesh's Ratlam district is a case in point. The village did not experience water shortages till the 1970s; three wells, a step well and a seasonal stream took care of their needs. From the late 1980s, the village kept slipping to "uncovered" status every few years despite measures taken by the state's public health engineering department (PHED). In 1978, the PHED installed public taps connected to the step well; in 1984-85 a check-dam was built on the seasonal stream and an overhead tank constructed to supply water to each household through taps; later, the department built dykes and check-dams to recharge groundwater. These measures pulled the village back to "covered" status only temporarily. When dry spells recurred, the panchayat demanded water from the Dholavar dam reservoir on the river Jhamand that supplies water to Ratlam city. The scheme to supply water from the reservoir through long-distance pipes was launched in 2006, said K K Bhandari, a PHED engineer. No one knows from where the village with a population of 7,000 will get water if the reservoir fails to sustain supply and the village slips to "uncovered" status again.

National Rural Drinking Water Programme has not taken off in many states; water security plans are still under preparation

Slow motion action

The website of the Department of Drinking Water and Sanitation (DDWS) of the Ministry of Rural Development shows the spread of slippage. States have reported varying figures of slippage, the highest being 21 per cent in Haryana (see map on *p*41). Two million people in India slipped from "fully covered" status to "partially covered" status between 2006 and 2009. What's more, about 144,000 rural habitations are affected by poor quality water containing harmful contaminants like flourides and nitrates. As on January 2011, about 67,000 habitations did not have drinking water facilities.

Unsustainable practices and ill-planned PHED interventions and consequent slippages forced the Centre to modify its Accelerated Rural Water Supply Programme of 1972. In 2009, DDWS renamed the programme—the National Rural Drinking Water Programme—and issued guidelines under it which set 2012 the new deadline for achieving 100 per cent drinking water cover for rural habitations (see 'What the guidelines say'). The guidelines stress on the sustainability of water



PHOTOGRAPHS: SARANDHA

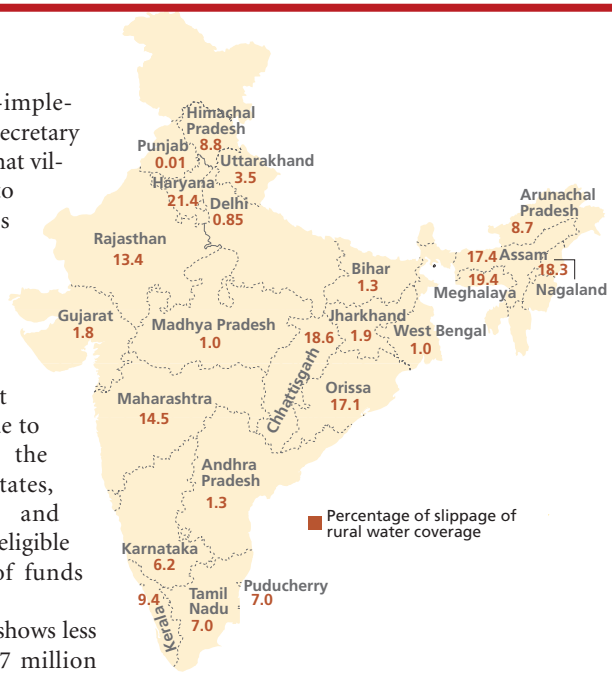
source and community participation, which had been absent hitherto. One of the highlights of the guidelines is that it envisages government agencies handing over water supply systems to communities under an exit policy, starting 2012 when the 12th Five-Year Plan begins.

But sources in DDWS said the programme has not even taken off in many states which are yet to implement basic measures like village-level water security plans and village water and sanitation committees (see 'Missed deadlines'). Water security plans involve calculating present and projected demand and supply, water budgeting and ensuring long term water availability.

The guidelines envisage PHEDs playing the role of facilitator, while the panchayats manage water supply system through village water committees, which would include women and members of deprived castes and tribes. The guidelines have ushered in a paradigm shift—from service delivery mode to adopting a rights-based approach to ensure drinking water security for all.

When asked about the non-implementation of the guidelines, secretary of DDWS, Vijay Bhaskar, said that village committees which have to prepare water security plans are still in their infancy. "We are working on setting up block resource centres to operate as nodal implementation agencies and ensure community participation, but it is taking time," he said. Due to poor implementation of the guidelines, only seven states, including Punjab, Kerala and Meghalaya, have been found eligible for the second instalment of funds under the programme.

Data available with DDWS shows less than one per cent of the 157 million people in rural Uttar Pradesh (UP) own and manage water supply systems and 70 per cent habitations are not covered by any water supply scheme. R M Tripathi, additional director of UP Jal Nigam, said water committees have been formed in all the panchayats but because these were not taken seriously till recently, "village water security plans are still under preparation". Tripathi said 70 districts have water testing laboratories and these are being upgraded. In Madhya Pradesh, a number of train-





What rural water supply guidelines say

- Adequate water supply received by households to be the criterion for being declared fully covered habitation; the earlier criterion was installation of water source
- Village supply schemes to be planned, implemented, operated and maintained by panchayats
- Village water and sanitation committees to be key local users
- Monthly social audits of PHEDs by gram sabhas
- Certificate about satisfactory completion of the schemes to be obtained from women's groups
- Village water security plans to be treated as elemental to designing sustainable, community-driven water schemes
- Social regulation of water used for agriculture, to ensure enough supply for drinking
- Convergence with the National Rural Health Mission (NRHM) for ensuring quality drinking water; with the Total Sanitation Campaign; and with the National Rural Employment Guarantee Scheme for construction and rejuvenation of ponds

Missed deadlines

Institutions to be set up	Deadline	Current status
State water and sanitation mission	June 1, 2009	All states have them
State water and sanitation support Organisation	June 1, 2009	All states have them
Sub-divisional laboratories	June 1, 2009	In process; no data available
Bank accounts	June 1, 2009	All states have them
District Water and Sanitation Mission	August 1, 2009	All states have them
Village water and sanitation committees	August 1, 2009	In process; no data available
Annual action plan	September 1, 2009	In process; no data
Comprehensive water security plan	March 1, 2010	In process; no data available

ing workshops have been held for PHED engineers on sustainability of water sources as a step towards implementing the guidelines, said Dhirendra Chawra, consultant with the state PHED.

In Bihar, too, institutional mechanisms are still being set up and district water security plans are under preparation. S N Mishra, a state PHED engineer, said a few rainwater harvesting projects have been undertaken to improve water source sustainability. But these are "insignificantly low", he conceded. In contrast, the water supply board of Tamil Nadu, has implemented many guidelines, including setting up village water committees; 57 per cent habitations in the state get piped water against the national average of 20 per cent.

PHEDs have limitations

A major problem in implementing the guidelines arises from the fact that PHEDs are expected to play the role of facilitators. Community participation, source sustainability and revival of traditional systems are ideas PHEDs don't seem convinced about. "Community participation has become a popular phrase, but how does one involve community without undertaking capacity building?" asked Mishra of Bihar PHED.

A PHED engineer in Ratlam said there are limits to what the department can do. "I have 600 villages under my jurisdiction. How can I undertake community mobilisation in each of these villages?" he asked. Engineers said politicians often ask them to design schemes overnight, so the projects in the past did not factor in geographical considerations or people's needs. Many officials seemed unwilling to assume the new role thrust on them. Chawra of the Madhya Pradesh PHED said it was not the department's job to set up village water committees. Bhaskar, secretary of DDWS, clarified that PHEDs have to initiate community participation and set up village water committees (see 'Mahukheda sets an example').

The state agencies could take a cue from some non-profits that have successfully implemented drinking water schemes by mobilising village communities, especially women and youth. For instance, women in Didakhedi, Karanjkhera and Rajukhedi villages in Madhya Pradesh's Sehore district used to walk three kilometres a day to fetch water. Since last year they have been getting piped supply from a community-owned system set up with the help of NGO Samarthan. The village water committee maintains the supply network and the accounts. "Since I joined the water committee, I have gained so much knowledge and confidence that I sit in the meetings with officials," said Jeevan Bai, a resident of Karanjkhera. She said women have become active in gram sabhas, too. In Kamhar village of Datia district in Madhya Pradesh, youngsters who would have migrated to cities in search of jobs have opted to work for the village welfare after NGO Parhit undertook community mobilisation and introduced rainwater harvesting and water resource management. Raghavan Singh, leader of the village youth group that monitors water quality, said many people are joining their endeavour.

Santoshi Tiwari, programme coordinator with Samarthan, said mobilising the community is of prime importance for a project to be sustainable. "Unless people invest labour, time, money and decision making in an effort, they don't feel ownership towards it and will not look after it," she said. But PHEDs continue to focus on building infrastructure and transferring it to communities without undertaking capacity building to empower water committees. Unless a robust community-managed system is put in place, slippages will recur and deadlines will have to be reset. ■

Karanjkhera village in Sehore district manages its own water supply system



Mahukheda sets an example

Mahukheda village in Madhya Pradesh's Dewas district was once famous for men remaining bachelors for life. People of other villages were unwilling to give their daughters in marriage to the village men because the place was water-poor and women had to spend hours fetching water.

Today, the village is the proud owner of a community-run piped water supply scheme. Each household gets tap water for 40 minutes a day from an overhead tank connected to a sump well. Recharge structures built three kilometres away under a watershed development project fill the sump well. The project was executed by the panchayat in association with the state public health engineering department (PHED). Check-dams, revival of old ponds and contour trenches were some of the works undertaken by the village watershed committee. The panchayat its took cue from the watershed development introduced by social activist Anna Hazare at Ralegan Siddhi in Maharashtra's Ahmednagar district. Funds were made available by converging works of PHED, the National Rural Employment Guarantee Scheme, Rajiv Gandhi Watershed Mission, Central Ground Water Board and Total Sanitation Campaign. The village water committee operates and maintains the waterworks and bills residents; its accounts show a balance of ₹1.97 lakh.

"Once a community realises a scheme's benefit, it sets its own rules for involvement. The role of the PHED is then to design a scheme that fulfils its aspirations and meets quality norms," said Rajesh Joshi, executive engineer with PHED Dewas.

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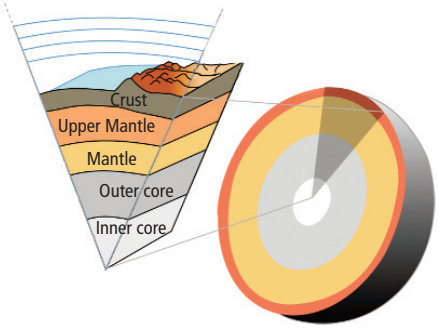
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EARTH SCIENCES

Tortoise, not rabbit



Previous estimates of how much faster the Earth's inner core is rotating compared to the rest of the layers of the planet have been found inaccurate. Earth scientists found the core is moving much slower at one degree every million years rather than at one degree every year. This is the first accurate estimate of the speed of the inner core. The confirmed value can now be used to model the formation of Earth's fluid outer core and evolution of magnetic fields. *Nature Geoscience, February 20*

TECHNOLOGY

Organic boost to solar cells

Researchers are trying to use materials with quantum dots to replace semiconductors like silicon in a solar cell. Quantum dots are tiny crystals, a few nanometers in size, and cheaper to produce than a thin-film solar cell. Quantum-dot solar cells can also be used to absorb various wavelengths of light. But their efficiency is low, making them impractical for use. Now using a combination of materials can boost the performance of these solar cells. The researchers added an organic molecule to a quantum dot cell. They found it improved the efficiency threefold. *Nano, Feburary 7*

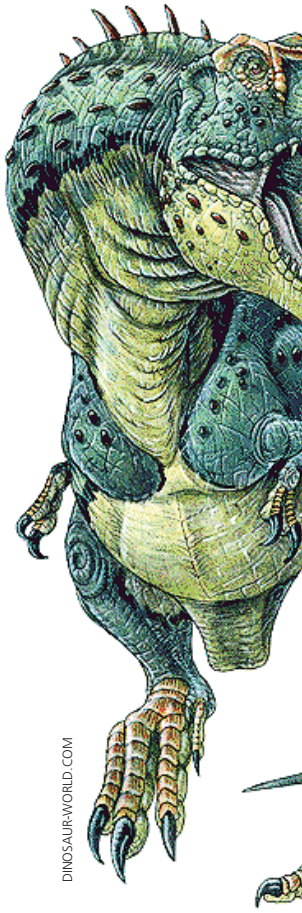


Stacy Bent of Stanford University led the team to create cheaper solar cells

MICROBIOLOGY

Fungi fight malaria

Malaria is a leading cause of mortality worldover. A new study has shown that fungi can more effectively prevent the spread of malaria larvae in comparison to use of mineral oils. *Metarhizium anisopliae* and *Beauveria bassiana* cause muscardine disease in mosquito larvae leading to their death. But the fungi become ineffective under UV radiations, high temperatures and on contact with water. So, the scientists used oil as a means to disperse the fungi in water. *Parasites and Vectors , February 22*

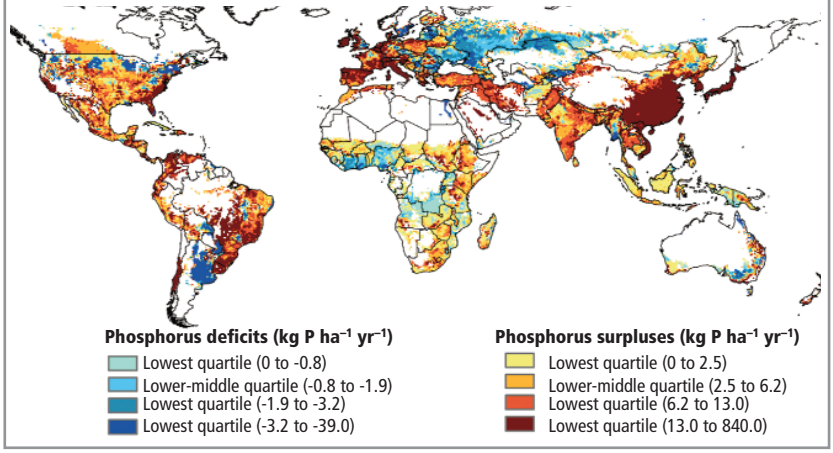


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ENVIRONMENTAL SCIENCES

Tracked: phosphorus use across the world

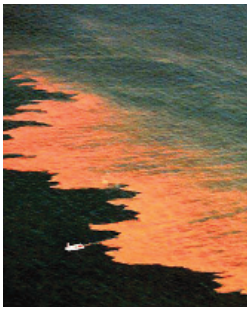
Phosphorus, a key component of fertilisers and plant nutrients, comes from phosphate rock, a non-renewable resource. So knowing how much amount of it is being used across the world is important, especially with increasing food demands. For the first time, a map has been produced showing imbalances in its use. While it is assumed that phosphorus deficits exist only in the poorer countries and surpluses dominate wealthy nations, phosphorus usage were found to vary widely within single region. The study used agronomic information for 100 different crops produced around the world in 2000. *PNAS, February 15*



LIFE SCIENCES

New danger from algae

Till now toxins produced by algae were thought to affect human and aquatic health. They were linked to rashes, fever and liver damage. But now scientists have reported that some unrecognised substances released by algae blooms act as endocrine disruptors. They can also interfere with the normal activity of reproductive hormones. This is the first identification of endocrine disruptors in algal blooms. *Environment, Science and Technology, January 31*



NOAA

PALAEONTOLOGY

Dino king more like hyena



The king of dinosaurs, *Tyrannosaurus rex*, is often depicted as blood-thirsty, stalking fellow dinosaurs. But a census of the animal's skeleton from swathes of eastern Montana has shown that the dinosaur was too abundant to have lived only on live prey. Instead it was like the hyena in Africa, which hunts both live prey and scavenges meat. The census of dinosaur fossils that date from 65 million to 95 million began in 1999. *PLoS One, February 9*

Tyrannosaurus rex both preyed on living animals and scavenged the dead, a census of fossils reveals



MAIT JURIADO

CLIMATE SCIENCES

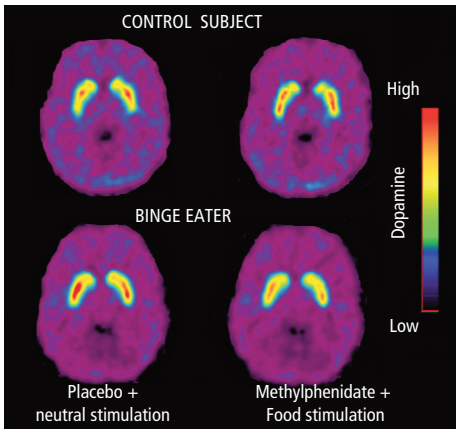
Ragweed woes extended

The misery of people suffering from ragweed allergy just got prolonged. Ragweed season in northern US has extended by two weeks. In Canada, it has stretched by a month. This is because of changes in global climate. The flowering season—which depends on warm temperatures—is getting shorter in southern latitudes. The opposite is happening in northern latitudes. This can change the way preventive medications is used. *PNAS, February 22*

HEALTH SCIENCES

Chemistry behind binge eating

A mere sight or smell of food is enough for binge eaters to get lured to the food. A brain imaging study has revealed that this elevates dopamine—a chemical linked to reward and motivation—levels in binge eaters. The chemical spike could explain compulsive overeating in such people. The researchers studied 18 obese persons, 10 of whom had binge eating disorder. They used positron emission tomography to scan the brains after injecting a radiotracer to bind dopamine. Each person was scanned four times on two different days to test the effects of food stimulation. *Obesity, January 24*



Obese people with and without the propensity of binge eating were given either a drug that delays the uptake of dopamine in the brain or a placebo. In binge eaters, there was an increase in dopamine (less red) at sight or smell of food

MARINE SCIENCES

Silence please

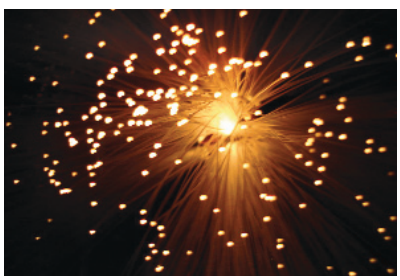
We all struggle to concentrate when there are loud noises outside our window. The fish suffer from the same problem. They become distracted from normal feeding behaviour when noise is added to their environment. Using underwater speakers to play noise at levels similar to those produced by recreational speedboats in a tank, the researchers found that three-spined sticklebacks made more foraging mistakes and were less efficient at consuming the food. The study paves the way for identifying potentially damaging impacts of noise on the everyday behaviour of animals. *PLoS One, February 28*



GREG TEE

PHYSICS

Efficient and versatile



Zinc selenide makes more efficient optical fiber

Optical fibers are the basis of the modern information age. Scientists have developed a new class of optical fiber, which allows for a more effective use of light. It has a core of zinc selenide—a light-yellow compound that can be used as a semiconductor. Unlike silica glass, traditionally used in optical fibers, zinc selenide is more efficient at converting light from one colour to another. Existing optical fibers are also inefficient in transmitting infrared light. But the new class has more versatility not just in the visible spectrum, but also in the infrared radiation. It can help develop more versatile laser-radar technology which can be used for improved medical and environment-sensing lasers. *Advanced Materials, February 25*

CLIMATE SCIENCES: *rainfall patterns*

Megadrought demystified

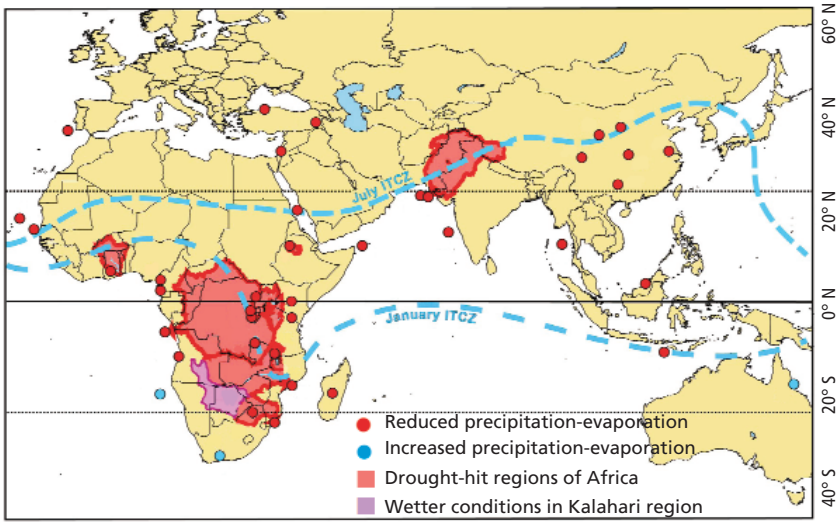
Two major lakes dried up in Africa in the most severe drought recorded in 50,000 years

SHRUTI CHOWDHARI

A MEGADROUGHT in parts of Africa and Asia about 17,000 years ago led to mass migration of humans and animals. It is regarded as the most severe in the last 50,000 years.

Rainfall in this drought-hit region is caused when winds from the northern and southern hemispheres converge near the equator. This area is called the Intertropical Convergence Zone (ITCZ). Till now it was believed the megadrought was caused because the zone shifted southwards. But researchers at Paul Smith's College, New York, reckon that many other forces were at play.

The team used radiocarbon dating and fossilised algae records from lake Victoria and lake Tanganyika, which lies south of the former. They found that the drought dried up lake Victoria in east Africa, the primary source of water for the Nile, and lake Tanganyika, the second longest fresh water lake in the world, in Tanzania. Based on this, they reasoned that the zone's shift southwards would have brought rains to the equatorial region once or twice annually. The spread of this drought would have happened only if the ITCZ had shifted at least 20 degrees south from the equator, researchers pointed. A smaller shift would have increased water content of lakes like Tanganyika, Malawi, Zambezi and Limpopo. The zone's shift was minor, they concluded.



Climatic conditions during the period the drought occurred

J Curt Stager and team from Paul Smith's College link the drought to the Heinrich Event 1 (H1)—atmospheric cooling caused by breaking icebergs and melting glaciers in the north Atlantic. The event that occurred at the same time as the drought, disturbed ocean currents and reduced rainfall in the Sahara desert and the African savanna. In the February 24 issue of *Science*, Stager said Afro-Asian rainfall declined as sea surface cooled due to the H1 event. This is linked to the weakening of atmospheric circulation over east Africa during H1. Similarly, cooler sea surface temperatures in southeast Atlantic and Indian Ocean could be behind the reduction of rainfall. "By showing how widespread and severe this drought was, we have shown that the earlier suggested cause of drying needs to be re-evaluated. The findings will help scientists understand better what people, cultures and ecosystems went through at that time," said Stager.

The drought is linked to atmospheric cooling caused by breaking icebergs and melting glaciers in north Atlantic

Future studies favourable

"The study by Stager improves an understanding of spatial and temporal responses of low-latitude monsoon systems. Even though there are major differences in the Earth system between the time period they studied and today, knowing that changes in the monsoon system have affected a large area is important," said John A Peck, associate professor, sedimentary geology, University of Akron, Ohio.

This study provides a method to explain the simultaneous droughts across the North and the South, said British geologist Christian Turney, University of Exeter, UK. "I do not see ocean cooling as a likely mechanism for future climatic change. But if this theory is correct, it would give an insight into the sensitivity of the climate system to the inflow of freshwater into the north Atlantic."

The important message from this paper, pointed out Robert F Anderson, geochemist at the Lamont-Doherty Earth Observatory, University of Columbia, is that these tropical rainfall systems are sensitive to perturbation. "Scientists must study how these systems might be disturbed by future changes in Earth's energy balance created by greenhouse gas emissions. Disturbance in rainfall systems can lead to droughts as well as floods," said Anderson. "Altering global temperature gradients can lead to big changes in tropical rainfall." ■

ECOLOGY: *invasive species*

Weeding out belief

Myth that invasive species dominate new habitats debunked

MOHD. SAJID IDRISI

A PLANT species native to tropical and subtropical America was introduced in India as an ornamental shrub during 1809-1810. Called *Lantana camara*, this weed is now found all over the subcontinent. Similar is the case with freshwater species *Eichornia crassipes* (water hyacinth). This weed was introduced from Brazil during 1914-1916.

Invasive plant species present a serious environmental, economic and social problem around the world as their abundance can lead to loss of biodiversity, and changes in an ecosystem. Despite substantial research, not much is known about why some plants turn invasive and dominate native plants in new habitats. A common but rarely tested assumption is changes in several ecological or evolutionary factors enable these plants to become more abundant in their new homes.

Scientists in a global collaboration tested this "abundance assumption" on 26 plant species at 39 sites in eight countries, including New Zealand, US, and Germany. They collected data on species-specific distribution and their abundance at the sites. Each site (0.1 hectare) was representative of a particular ecosystem, like tallgrass prairie. The data was analysed using various statistical packages. The research team found that the "abundance assumption" did not hold true for the majority of a species. Twenty of the 26 species examined had either similar or lower abundance at introduced sites compared to native sites. For instance, grass species were abundant both in the native country and the introduced country, while herbs were more abundant at home, stated the study published in the February issue of *Ecology Letters*.

The researchers said increase or decrease in a species' population is not a precondition for invasion success; and increases in species abundance are unusual. Instead, a better generalisation would be abundance at native sites can predict abundance at introduced sites, they claimed. Abundance of introduced species at a site could help evaluate whether the species should be introduced at other sites, said lead author Jennifer Firn from the Queensland University of Technology, Australia. "The finding provides a criterion for biosecurity screening processes." It may help develop reliable standards for preventing introduction of invasive species, said M Irfan Qureshi, assistant professor at faculty of natural sciences, Jamia Millia Islamia in New Delhi. ■



Lantana camara ***is one of the world's 10 most invasive weeds***

SOIL SCIENCES: *erosion*

Measure of tolerance

New way to calculate capacity of soil to resist erosion

DINSA SACHAN

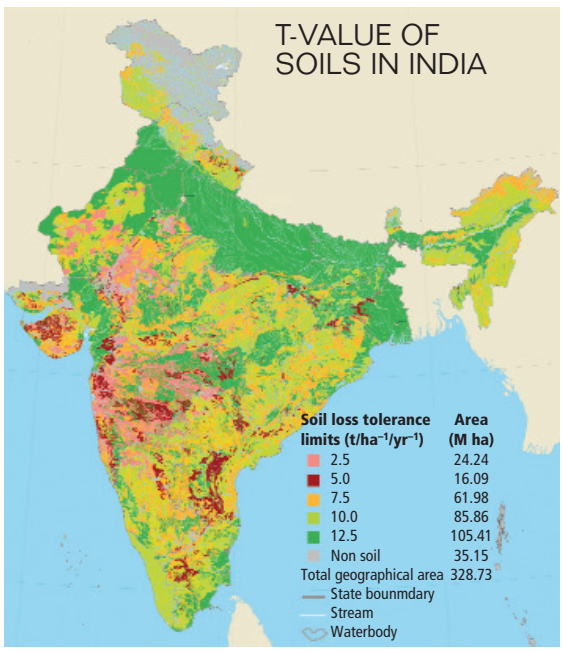
SOIL erosion worldwide is threatening agriculture. A group of scientists has calculated that about 7.5 per cent of the soil in India is extremely vulnerable to erosion.

Scientists at the Central Soil and Water Conservation Research and Training Institute in Dehradun employed a concept to evaluate susceptibility of soil types to erosion across India. Called T-value, the concept refers to the maximum amount of loss a soil can tolerate per hectare per year without affecting crop productivity. If a soil type is eroded beyond its T-value, it will hamper crop cultivation.

A default T-value of 4.5 to 11.2 megagrammes per hectare per year (Mg ha^{-1} yr^{-1}) is assumed for most soils in India.

Although all types of soil have the ability to withstand a certain amount of erosion, it is unavoidable, argued researchers in the study published in the February issue of *Current Science*.

"Till date no standard method existed to calculate soil loss tolerance, especially in the Indian context," said lead researcher Debashis Mandal. The current method will help adopt measures



that can bring erosion down to permissible limits, he added. Soil erosion is known to exacerbate desertification.

The research team studied a total of 1,649 soil mapping units representing various physiographic regions of India, like coastal plains, mountains and the peninsular plateau. The soils were classified into three categories on the basis of five factors, namely infiltration rate or the soil's ability to absorb and channel water, bulk density, soil erodibility, organic carbon, and pH, a measure of soil's acidity. Each factor was graded on a scale of zero to one, with zero representing the lowest value on the basis resistance to erosion.

Further, different "weights" were assigned to the factors based on their importance in resisting erosion. Infiltration rate was given the maximum weight and bulk density the least. Based on this calculation, the soils were grouped into three categories depending on their resistance.

The T-values of the soils were obtained by cross referencing values of the three groups against the depth of the soils in question.

The researchers found that about 57 per cent of the area in India has T-value less than 10.0 Mg ha^{-1} yr^{-1}, and 7.5 per cent area has a T-value of 2.5 Mg ha^{-1} yr^{-1} (see box).

Black soil found in regions of Maharashtra and Gujarat is most at risk of erosion as the areas witness intense and erratic rainfall. "The content of organic carbon is also very low, thus ability to resist erosion is poor. These soils contain high amounts of clay particles, which are eroded most easily," Mandal added. Researchers cross-checked these results with the time-tested productive-index approach, which measures crop productivity of a soil. The results were in compliance.

Stephen Porder, assistant professor of biology at Brown University, said the study was interesting but it was unclear why weights were assigned, or how sensitive the results are to the weighting choice. He added, "Without such analysis it is hard to know whether the study accurately captures the spatial variability it proclaims to."

A 2010 study by the same institute had revealed India loses 5,334 million tonnes of top soil annually due to soil erosion. ■

TECHNOLOGY: *disease detection*

TB diagnosis in two days

Quick diagnosis of active tuberculosis can check indiscriminate use of TB drugs

ISHITA DAS

ABOUT 500,000 people in India die from tuberculosis (TB) every year. The disease can lie dormant in an infected person for years without showing any symptoms but those with weakened immune system, like HIV/AIDS patients and the malnourished, are likely to develop active and contagious TB. Current diagnostic techniques, including a series of blood and skin tests, and chest X-rays, can take four to 12 weeks to give accurate diagnosis of whether a person has inactive infection or active disease.

Now a group of scientists has optimised a technique to discriminate between the two in less than two days. Scientists at the University of Lausanne in Switzerland in collaboration with the University of Cape Town in South Africa employed a technique that uses laser beam to differentiate and separate cells based on the proteins they express.

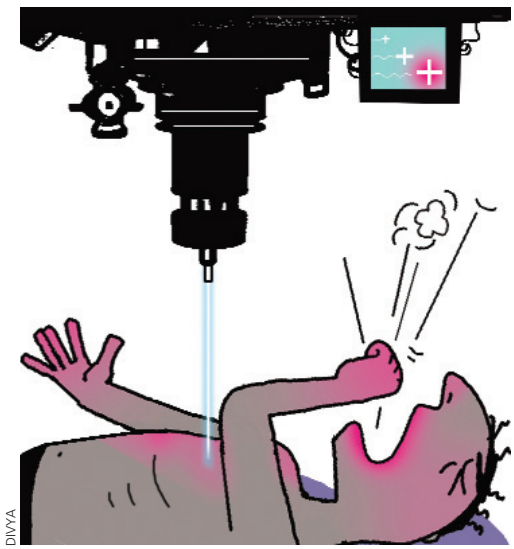
Rapid diagnosis to separate inactive from active is important because people exposed to the bacteria for a short period should not be subjected to the side-effects of TB drugs, according to Nisheeth Agarwal, assistant professor at Translational Health Science and Technology Institute in Gurgaon. "Indiscriminate use of TB drugs can give rise to multiple-drug resistant strains," the expert added. Starting treatment as early as possible is also a priority as the disease progresses very quickly, he added.

The research team, led by Giuseppe Pantaleo of University of Lausanne, took samples of T cells of 300 patients diagnosed with inactive infection and active disease. T cells are the body's army that fights different types of infection-causing bacteria, including a subset directed towards the TB bacterium.

The team characterised this subset using the polychromatic flow cytometry technique to differentiate between inactive infection and active disease. They then used a combination of antibodies against six different types of proteins.

When excited by a laser beam, these antibodies give different colours.

In patients with active disease, the researchers found, the T cells displayed two colours simultaneously, for proteins CD4 and TNF-α.



DIVYA

A double-blinded study carried out in South Africa corroborated this discovery. The technique was successful in detecting active disease in 80 per cent of the cases.

The findings have been published in the February issue of *Nature Medicine.*

But the technique, Agarwal claimed, is not likely to be effective for those with compromised immunity, like people with HIV, since they have reduced levels of T cells to begin with. "It also appears to be expensive," he pointed out.

TB is caused by *Mycobacterium tuberculosis.* The disease spreads through the air, when a person infected with the bacteria sneezes, spits or coughs.

The bacteria usually attack the lungs, but can also affect the brain, the spine and kidneys. ■

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ECOLOGY: *colonisation*

Ant's invasion plan decoded

The fire ant first went to the US, then conquered the world

IPSITA SARKAR

THEY entered the US from Argentina in the 1930s armed with lethal venom, gained a foothold in southern parts of the country and then marched to invade faraway countries across the world.

Such is the invasion strategy of Red Imported Fire Ant, or *Solenopsis invicta*, one of the world's highly aggressive and venomous ant species, as per a research published in *Science* on February 25. The ant has spread to several countries, including China, Taiwan, Australia and New Zealand, in the past 20 years. They can cause a fatal allergic reaction, anaphylaxis, among people, kill livestock, ruin crops and even damage electrical equipment like air conditioners and traffic signal boxes.

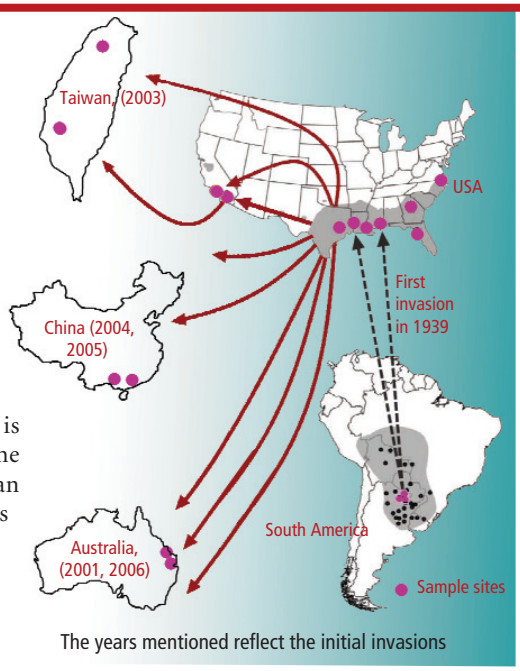


To determine the ant's origin, researchers led by DeWayne Shoemaker of the US Department of Agriculture collected ants from 2,144 colonies at 75 areas across the world and analysed their genome. The data suggested at least nine separate introductions of *S invicta* have occurred so far (see map). The southern US population is the origin of *S invicta* found across the world except the ones in Carribean countries. They might have spread as stowaways on cargo ships, the researchers said. So far the ant was thought to have spread from its native place in South America.

An understanding of their pattern of invasion and evolutionary shifts can help develop effective strategies against it, the researchers noted. At present insecticides and phorid fly, the ant's natural enemy, are the only means to contain their spread.

Studies have shown the fire ant can survive in warm and humid climate, and soil temperature is the key factor regulating its growth and reproduction, said Marina Ascunce, co-author of the study. This means almost half of the globe, including India, is at risk of the ant's infestation, she added.

Himender Bharti of the International Network for Study of Asian Ants agreed that Indian climate supports the species. The country already has a variety, *S geminata*, which is less aggressive. If *S invicta* reaches here it would not take long before it establishes its foothold in the country, he said. ■



The years mentioned reflect the initial invasions

HEALTH SCIENCES: *disease control*

Soapnut, a mosquito repellent

It inhibits growth of larvae and pupae of mosquitoes

BIPLAB DAS

HAILED for being a vital ingredient in traditional medicines, cosmetics and detergents, soapnut can now combat mosquito-borne diseases and thus reduce indiscriminate use of harmful insecticides and mosquito repellents.

Kernel extracts of soapnut disrupt the activity of enzymes of larvae and pupae and inhibit the growth of *Aedes aegypti*, a mosquito that spreads viral diseases such as yellow fever, dengue and chikungunya. These diseases affect over 30 million people every year worldwide.

Findings of the study were published in the online edition of *Acta Tropica* on January 18, 2011.

In an earlier study, when researchers exposed the larvae of *A aegypti* to 4 mg of soapnut extract mixed with one ml water, they died within 18 hours. At a concentration of 5 mg of soapnut per ml of water, the extract caused 100 per cent pupal mortality within 18 hours.

Researchers have now studied the impact of the extract on enzyme activity of the mosquito. "We found that soapnut extract significantly disrupts the metabolic activity of exposed larvae and pupae of *A aegypti*," said lead researcher Periasamy Mullainadhan of Madras University's of zoology department. Signs of this disruption were detected by way of reduced activities of metabolic enzymes of larvae and pupae of *A aegypti*.



Researchers specifically studied the proteins and marker enzymes esterases and phosphatases in the developmental stages of *A aegypti*. Esterases play a role in reproduction, digestion and metabolism of hormone in larvae. Phosphatases are important for diverse physiological processes such as cellular metabolism and activity of genes.

These enzymes have been used as accurate biomarkers to evaluate toxicity of insecticides.

There was significant reduction in the activity of acetylcholinestarase and betacarboxylestarase—enzymes in the larval stage of the mosquito. The outcome of this study also shows that the mosquito's pupae are more tolerant to toxicants than the larvae. ■



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Scarcity 500-1,000
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'000 liters/person/year



Public good, private concerns

Odisha is becoming a testing ground for ADB's aggressive water sector reforms



RANJAN K PANDA

As water gets scarce, the lendings in the sector by international financial institutions like the World Bank and the Asian Development Bank (ADB) are being looked into more critically. Most critics believe that with small investments, the banks have been able to dictate water policies in developing countries. These institutions have successfully infused the idea of privatising water resources in the name of Integrated Water Resources Management (IWRM).

Simply put, IWRM means considering multiple views on how water should be managed. These relate to situations such as planning river basin, new capital facilities, controlling reservoir releases, regulating floodplains and developing new laws and regulations. On the face of it, there does not seem to be much wrong about such water management. But for ADB, such management is integral to its plan to privatise water.

Time is, therefore, ripe to look into how ADB approaches our water future. The analysis is also pertinent because the National Water Policy is up for a review. Odisha, from where I hail, is fast becoming a laboratory for ADB's policy to privatise water.

In late 2010 in a review, ADB's Independent Evaluation Department vetted Water for All—the bank's water policy since 2001—as consistent with the bank's corporate strategy. It found the policy in consonance with the "international consensus" on IWRM. The review found that in the past 10 years ADB put more effort into becoming a creator of water knowledge than in enabling access to it. It also found that the policy is geared towards influencing decisions in countries that borrow from ADB.

In India, the review pointed out, water reforms have been most successful in Maharashtra and Karnataka. Tariff collection and cost recovery were deemed major indicators of this success. The review also cited China as a success story. It noted that success has not yet been possible everywhere and to the desired extent.

The review also admitted that the current approach of considering IWRM in large basins is complex and difficult, and noted that the problem stemmed from a disconnect between policy development and operations. It suggested that policies must percolate deeper to smaller units of governance, making it evident that ADB will become aggressive in promoting IWRM.

The evaluation found sustainability as one of the weakest areas of ADB lending in water projects. Only 44 per cent of completed projects were rated likely or most likely sustainable. Cost recovery was among several factors making a project unsustainable.

The aggressive intent of ADB manifested in Odisha recently, where a draft Technical Assistance Report, prepared by its consultants has been put in the limited public domain of the Internet. The report advocates pricing water resources to the extent of cost recovery. It also calls for private sector participation.

The ADB has suggested the government of Odisha exert more pressure on farmers by recovering complete cost of irrigation. This could prove disastrous in a state where the number of farmer suicides is increasing due to crop failure and lack of ensured irrigation.

The report mentions that the per capita water availability in the state has reduced from 3,359 cubic metre in 2001 to 3,300 cubic metre. This is not supported by any reference. According to the non-profit, Water Initiative Odisha, the state's per capita water availability is down to 3,000 cubic metre at the least. In fact, with water guzzling and industries increasing manifold after 2001, it would not be surprising if Odisha's water levels are even below 3,000 cubic metre.

The report's projection of water availability in the year 2050 at 2,200 cubic metre is flawed as well. According to IPCC's projections, global water availability will reduce by 40 per cent by 2025. The UN projects that "by the year 2025 the demand for freshwater is expected to rise to 56 per cent above what currently available water can deliv-



ILLUSTRATIONS: DIVYA

er". Extrapolating these projections to Odisha shows that the state would have 2,000 cubic metre of water in 2025—and much less in 2050. One can say the extrapolation from global projections might not work for any state in India. But with Odisha planning to generate about 60,000 MW of electricity from coal-fired power stations in seven to eight years, and with water-guzzling industries proliferating in the state, fears about the state water's availability plummeting below levels projected in the report seem real.

The report talks about establishing a water regulatory authority and using it to recover from farmers the costs of all water supplied to them. The functioning of such an authority in Maharashtra is already under severe criticism from farmers and civil society groups. The authority has got a severe rap for being influenced by corporate and rich water users.

Pressured by civil society critique, the ADB did admit constraints in collecting accurate data. The state government too, it seems, has made press statements that it is planning to extend the date of seeking opinion on the Technical Assistance Report. But the aggression to push through the plan has not gone down. In fact, when plan was up for public comments, the government went ahead with publishing a resolution for constitution of a river basin organisation that will take up IWRM.

ADB's projection for water availability in Odisha for 2050 does not take into account water-guzzling industries

ADB is now reviewing its accountability mechanism to make it more transparent and accountable to countries it lends, and to project affected people. But accountability does not figure in Odisha's IWRM plan. What is more surprising is that a base paper by an ADB water resource expert, that set the tone for this plan, points that earlier IWRM plans in the state failed because they were rather imposed from the top.

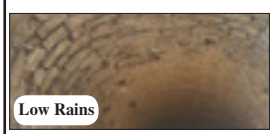
ADB and the state government have not taken lessons from the past and ongoing conflicts around distribution of water resources in the state. In fact, the state is currently in news for bitter water fights, the latest phase of which started with the Hirakud conflict (see 'Ground Swell', *Down To Earth*, Dec 16-31, 2007). The recent and most talked about conflict relates to diversion of water from Mahanadi for POSCO.

Civil society organisations have been demanding the government assess the exact availability of water resources in the state before sanctioning more water-guzzling industries. It's a justified demand in a state where a meagre 20 per cent of agriculture gets irrigation water, but more than 70 per cent people depend on agriculture. As veteran water expert Ramaswamy Iyer put it, "In place of the current slogan of IWRM, government and lending institutions should concentrate on responsible and just use of water resources." ■

The author is convenor of Water Initiatives Odisha and freelance journalist

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2009 No Rain, 2010 Heavy Rain, 2011....?



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Breach of trust

The world's premier rice research institute tilts towards intellectual property rights



SHALINI BHUTANI



The International Rice Research Institute (IRRI) completed 50 years in December 2010. Its gene bank holds over 100,000 accessions of rice from 125 countries. Roughly 80 per cent of these are varieties developed by farmers. Since 1959 when IRRI was conceived as a benevolent corporation, much has changed in research and development in agriculture.

The private sector has emerged as a major player in the development and spread of agricultural technologies. Today seed technologies are subject to various forms of intellectual property regimes. The rice research institute has embraced corporates and IPR, and not countered them. This is not because it *has* to, but because it *wants* to. In doing so the institute has compromised its intended service to "poor rice farmers" and National Agriculture Research and Extension Systems in developing countries. India and the many rice-growing farmers across Asia will now see reduced *public* services of IRRI as it cosies up to the corporate sector even more and begins to look and behave more like a private company.

IRRI's Board of Trustees confirmed the institute's new policy on intellectual property rights (IPR) at a meeting at Hanoi, Vietnam, in November last year. A draft had been under discussion much before. Despite requests from farmer groups and NGOs, the text was not made public, till recently. The final four page document in effect now comprises a Preamble with 10 "general principles".

The policy makes IRRI's pro-IPR stance clear. It states IRRI may seek protection of its intellectual assets (including germplasm) or impose restrictions on its use by others. The new policy unabashedly proclaims that IRRI shall enter into formalised collaborations with the private sector. So much for its *public* mandate.

The legal status of planting material at a global level also changed in 1993 from it being a free-for-all "common heritage of mankind" to national sovereignty as per the Convention on Biological Diversity (CBD). This concept of sovereignty is meant to recognise local peoples' contributions, for example farmers' role in crop evolution through seed conservation and variety selection. IRRI has the responsibility to keep this farmer-developed material "safe" as an international public good (IPG). That means free from any IPR that converts it into a private good.

As with any planting material collected pre-CBD— before 1993—this rice is governed by rules of the UN's Food and Agriculture Organization (FAO). IRRI had in 1994 signed agreements with FAO to hold the collections *in trust*. When passing on the rice germplasm, the IRRI was bound to sign a material transfer agreement that requires the recipient not to seek IP protection on the material. But this obligation got diluted when FAO's International Treaty on Plant Genetic Resources—known as the plant treaty—came into force in 2002. So IRRI's 1994 Agreement with FAO lapsed and got replaced by a 2006 Agreement with the Governing Body of the Plant Treaty. Even then, IRRI cannot claim ownership over rice in its gene bank.

> The new policy proclaims the institute shall enter formalised collaborations with the private sector

Notably, in IRRI's IPR Policy of 2010 the word "trust" with respect to gene bank material has been dropped. The policy does not have any commitment that IRRI made in its 1994 Policy to *not* seek any form of intellectual property protection on the rice genetic resources it holds in trust.

The new policy also endorses "biotechnological innovations" in agriculture like genetic engineering. Protocol III of the old IPR policy has been replaced by a general principle on "biotechnological innovations", which makes clear that IRRI will respect IPR others have on materials and methods used in the development of GM crops.

With its privileged access to farmers' seeds IRRI ought to be respecting both farmers' needs and their beliefs. Farmer seed systems are based on free exchange of planting material. ■

Shalini Bhutani works on law and policy issues related to agriculture and biodiversity



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>> Towards wetland conservation <<

CHECK LAND SHARKS

ASAD RAHMANI, director
Bombay Natural History Society

The Government of India should enact a wetland conservation act, on the lines of the Forest Conservation Act, 1980. But it should also consider the views of people dependent on wetlands. Millions of acres of village, semi-urban and urban wetlands are controlled by gram panchayats or city administrators. Most often administrators have no interest in protecting them and succumb to land sharks easily. Many times, wetlands are "inspected" during peak summer, when they have no water, and allocated to land sharks as wastelands.

FOOD SECURITY

R S LAL MOHAN, chairperson
Conservation of Nature Trust, Nagercoil

India is a signatory to the Ramsar Convention which slots irrigated agricultural lands, and canals under wetlands. But the wetlands conservation rules, 2010, does not have river canals paddy fields and the coastal wetlands in their ambit. Paddy fields are under water for more than six months and in certain areas like Kerala they are under water throughout the year. So paddy fields should not be excluded from wetland conservation. Not conserving these fields will seriously affect food security and groundwater sources. Tamil Nadu, for example, has lost about 600,000 hectare of paddy fields after Independence.

BLIND TO PONDS

MOHIT K RAY, founder-director
Vasundhara (a citizen's group for water bodies), Kolkata

The framers of the rules have no idea of small ponds in the country, both in urban and rural areas. The draft rules do not have the term "pond" , though they do use a roughly similar term, "tank". They are not sensitive to the way ponds and tanks are managed. For example, the rules do not permit "construction except boat jetties within 50 metres from mean high flood level of water bodies". But thousands of small ponds have bathing stairs(*ghats*) and bathing facilities within this restricted area. Area surrounding ponds are also places for recreation. Will such recreation be banned? There are heritage structures like temples, mosques near ponds which require maintenance and development. If the draft rules become an act, these activities will be illegal.

The rules mandate "prior approval from state for aquaculture and horticulture". Most ponds and tanks are used for aquaculture and the earnings from these activities are the only source of financing maintenance.

The Union environment ministry has been working for the past four years to create a regulatory framework to protect the country's wetlands. In June 2008, it framed rules to protect wetlands. The draft was criticised by lawyers, environmentalists, activists and people dependent on wetlands. In December 2010, the ministry revised the rules under the Environment (Protection) Act, 1986, and called them Wetlands (Management and Conservation) Rules, 2010.
***Down To Earth* sought comments on the rules from people involved in conserving wetlands**

FAULTY LIST

RITWICK DUTTA
Environmental lawyer

The forest conservation law recognises only certain categories of forests as worthy of conservation. If a stakeholder or an environmentalist wants legal protection for a forest not in the list, then he or she has to file a public interest litigation in courts. We might face similar situation with respect to wetlands, if the draft rules become an act. People might have to take help of the court if they need legal protection to save wetlands not listed.

CARETAKERS AND FACILITATORS

TEJ RAZDAN, secretary
Jheel Sanrakshan Samiti, Udaipur

Today, the government controls all wetlands in the country. The involvement of society is almost minimal. The government ought to become a facilitator, while society should become caretaker of wetlands. Significant decisions pertaining to the conservation and welfare of wetlands should be initiated by the end-users of water bodies. Their suggestions should provide guidelines for decision-makers in higher levels of government. I fear the wetlands rules are a subterfuge to regularise encroachments on shrunken wetlands. The rules do consider "overall well being of the people". But I believe this should be rephrased to "overall improvement of ecosystem" to preclude encroachments and construction activities on wetlands. For the same reason, the section "expedient in the public interest" should be rephrased with "expedient in the environmental interest". ■

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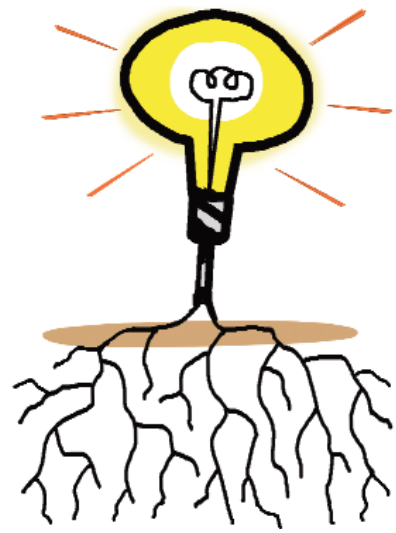
OUR FRUGAL INNOVATION

India is working on a model of inclusive innovation to provide solutions for people at the bottom of the heap. Will it work?

Of all the words that have been coupled with innovation, "frugal" must rank as the most intriguing—and it is an Indian invention. "Frugal innovation" is a term coined by the Planning Commission, which proffers it as a radical solution to finding more appropriate processes and products to tackle the development gaps in our society.

Here's how the Planning Commission envisions it: "India needs more "frugal innovation" that produces more "frugal cost" products and services that are affordable by people at low levels of incomes without compromising the safety, efficiency and utility of the products. The country also needs processes of innovation that are frugal in the resources required. The products and processes must also have "frugal impact" on the earth's resources." For a government organisation that is steeped in the old ways of looking at development issues, you cannot get more innovative than this.

The touchstone is inclusive growth. The PlanCom's argument is that the conventional innovation paradigm, based on the number of scientists deployed and huge research and development (R&D) funding, will produce expensive innovations whose costs have to be recovered from the pricing of the products they turn out. A good example, it says, is the pharmaceutical industry which finds it uneconomic to develop low-cost solutions for ailments that affect the poor. Ergo, innovation with fewer and less costly inputs.



DIVYA

Driving this concept will be the National Innovation Council (NIC) headed by Sam Pitroda, adviser to the prime minister on public information infrastructure and innovations, and its task is ambitious. It hopes to re-trigger an innovation culture across the board, in government, institutions and society, to meet development challenges in practically every sector, from health, agriculture and urban infrastructure to public service delivery and governance.

Frugal innovation is not exactly a new idea in *jugaad* country that is India. *Jugaad* is a cheap, improvised solution to a problem or a need, and we excel in it. Not having enough resources has forced us to innovate in weird and wonderful ways. From the strange motorised contraptions on the roads to the skilful adaptations of farm implements and electronic appliances, we have learned to make do with little funds and a lot of skill. And not just at the bottom. On a more sophisticated level, Indian surgeons and hospital administrators have perfected the art and technique of providing hi-tech eye and heart surgeries at a fraction of the cost in the developed world.

Examples of native innovation are thick on the ground. You only have to go to the website of the Honey Bee Network started by IIM-Ahmedabad professor Anil K Gupta to learn how prolific Indians are in using traditional knowledge and practical skills to solve day-to-day problems. The "barefoot professor" has been doing a great job of scouting for rural innovation and has recorded around 10,000 of these. When I first met him 13 years ago I had been sceptical of his ability to make much of an impact since funds were tight and institutional support was minimal. But carried along by his passion and the National Innovation Foundation (NIF), set up by the Department of Science and Technology with a tiny corpus of ₹20 crore, the unique Honey Bee Network has been able to commercialise some of the innovations.

NIC appears to have been largely inspired by the Honey Bee philosophy. Gupta is one of the 17 members of NIC along with NIF founder-chairperson R A Mashelkar. But NIC is thinking big. In two-three months, it hopes to create a ₹1,000-crore fund that will provide venture capital for new ideas that could solve problems in the health, education, urban and rural infrastructure, transport and sanitation sectors. It seems an overly optimistic expectation since the fund, barring a small contribution from the government, will be a private one.

Would angel investors or venture capitalists be willing to risk their money in such ventures unless they are sure of returns? The PlanCom briefing paper admits this could be a serious problem since private equity funds, although swelling in India, are channelling investments into large and "safer" investments. It also admits that social enterprise initiatives, innovations that produce socially useful outcomes for the poor and which appear to be the heart of the innovation programme, are less likely to attract private capital because returns would be harder to guarantee.

While trying to create appropriate ecosystems to foster innovation, NIC could get trapped in its own rhetoric. Can the "Indian model of innovation" afford to ignore what developed countries think are the best way to boost innovation? OECD, the grouping of rich nations, believes it is through investment in education, R&D and "knowledge-supporting infrastructure", such as broadband. Can India do without these basics? ■

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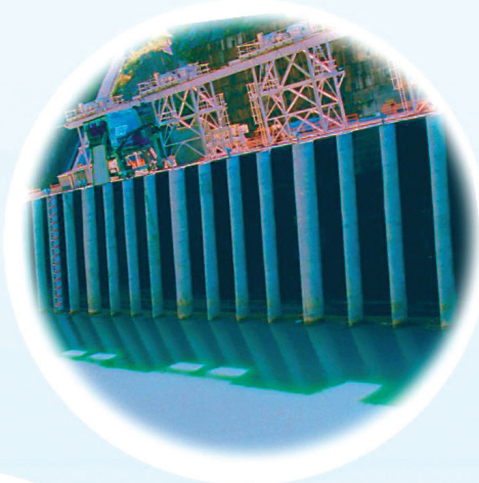
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One Project in Nepal
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Two Projects in Bhutan
Kholongchu HEP (650 MW) and Wangchu HEP (600 MW)

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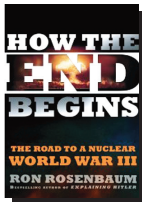
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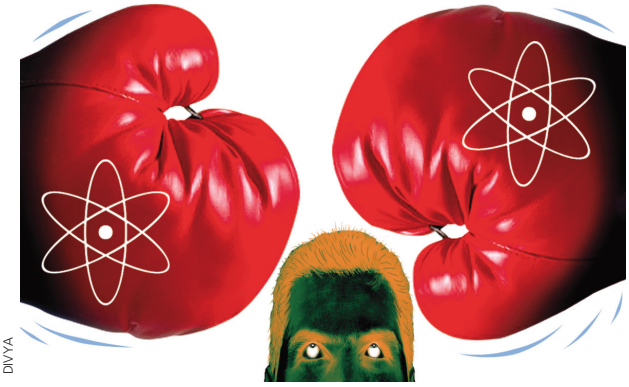
www.sjvn.nic.in



BOOK>> How The End Begins: The Road To A Nuclear World War III • *by Ron Rosenbaum* • Simon and Schuster • US $28

War is upon us

SUBHADRA SCHNEIDER


DIVYA

About five years ago, European media described the imminent possibility of a US strike against Iran's nuclear infrastructure. It seemed plausible at the time, given the Iranian regime's declaration of war against the US, Israel, and the UK. About the same time, Iran's top military strategist, Hassan Abbasi, publicly declared war plans against the west. There was a veiled threat of use of nuclear weapons. The matter died down after attracting media attention for a few weeks.

The coverage was symptomatic of how media has dealt with matters pertaining to nuclear weapons. Sensational episodes grab headlines. Global nuclear destruction is, in the minds of many observers, largely a forgotten hazard. Society has become so used to the notion that nuclear weapons are a compelling deterrent, but no one seems crazy enough to actually use them.

US journalist Ron Rosenbaum does not believe so. In *How the End Begins: The Road to a Nuclear World War III*, he writes, "We are, and always have been, perilously close to nuclear war at any given time." He charts the likely origins of a nuclear war in the short term, probably in West Asia—where Israelis fear a second Holocaust, this time a nuclear one—or Pakistan, where stray nukes may yet land in the hands of Islamists or in tensions and miscommunications between the Russia and the US. South Asia is a nuclear flashpoint.

While the US and Israel deny any formal nuclear umbrella arrangement, there is widespread speculation that the US has warned nations contemplating a nuclear strike on Israel of severe consequences, which implies anything, including nuclear reprisal. In fact, in 2008 in the contest for the Democrat candidate for the US president, now secretary of state, Hillary Clinton, declared that the US would "obliterate" Iran if it attacked Israel with nukes.

Rosenbaum draws us to such episodes and in process pursues thorny moral questions, including one about nuclear retaliation: "Would it be justice, vengeance or pure genocide to strike back once a country has been comprehensively bombed?" When under attack a nation almost always responds in kind, with the exercise of military power to fend off the aggressors, preserve remaining lives and, ultimately, win the war. But when the weapon of choice can kill billions is a reaction that wipes out the rest of humanity morally justifiable?

Rosenbaum does not much engage with literature that dismisses nuclear peril, but writes "only luck has saved us, our luck is bound to run out." He quotes a study by Carnegie Endowment for International Peace that the world "is at tipping point." At places the book takes unnecessary detours towards a range of writers: Dante, Terry Southern, Philip Roth, Cormac McCarthy. Overall, however, the gravity of the topic is never undersold. Make no mistake. We are in a new nuclear era, with new rules and new kinds of brinkmanship. The threat of destruction of humankind is real. But then so are the possibilities for secure peace. The path we take depends on our politicians. ■

Subhadra Schneider is a New-York based writer on international affairs

FROM THE BLURBS

ZOO CITY *by Lauren Beukes, Angry Robot, ₹300*

For a genre that is often exploring different and alien cultures, science fiction has not always been brilliant at noticing the ones on Earth. Zoo City is amongst the few. With characters deeply twisty you can lose a giant squid in their nebulous hidey holes, and with turns of phrase that are as likely to conjure up Rudyard Kipling, Lauren Beukes has created an energetic and imaginative fusion of sci-fi and noir thriller.

ANIMAL RIGHTS, WHAT EVERYONE NEEDS TO KNOW, *Paul Waldau, US $16.95*

Organised around a series of probing questions, the book offers an even-handed survey of the animal rights movement. Readers will gain insight into history of animal protection and become familiar with a range of hot button topics like attempts to balance ethical treatment of animals with their use for livelihoods. Chronicled here are key figures and organisations involved with the animal rights movement, as well as legislation and public policy.

SOCIAL RESPONSIBILITY AND ENVIRONMENTAL SUSTAINABILITY IN BUSINESS EDITED *by Preeta M Banerjee and Vanita Shastri, Response Books, ₹350*

Reduction in public and private spending on social programmes has thrown up challenges for environmentally sustainable growth. The book advocates countering the trend through global social entrepreneurship and local solutions.



हर विपदा में किसान के साथ

किसानों के संकट की हर घड़ी में
मध्यप्रदेश सरकार उनके साथ।
फसल खराब होने पर किसानों को राहत के लिये
राजस्व पुस्तक परिपत्र में व्यापक बदलाव।
प्राकृतिक आपदाओं से प्रभावित फसलों में
राहत के लिये अभूतपूर्व फ़ैसले।

अब दो हैक्टेयर असिंचित जोत पर 50 प्रतिशत से अधिक के नुकसान पर साढ़े चार हजार रुपये प्रति हैक्टेयर और सिंचित भूमि पर साढ़े आठ हजार रुपये प्रति हैक्टेयर की दर से राहत।

नये नियम के अनुसार अब तुअर को बारहमासी फसल मानकर 50 प्रतिशत से अधिक क्षति पर ₹ 11 हजार प्रति हैक्टेयर की राहत राशि।

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राजस्व पुस्तक परिपत्र में फसलों की क्षति पर राहत की राशि बढ़ी।

▼▼▼▼ किसान हित के नये निर्णय ▼▼▼▼

- अगले वित्त वर्ष से सभी किसानों को एक प्रतिशत की ब्याज दर पर फसल के लिये सहकारी ऋण।
- प्रभावित किसानों का भू-राजस्व माफ।
- ऋणों की वसूली स्थगित।
- ऋण राशि का एक वर्ष का ब्याज भी माफ।
- कर्ज राशि पर एक वर्ष की ब्याज माफी के बाद दूसरे वर्ष लगने वाली 12 प्रतिशत ब्याज दर के स्थान पर ब्याज दर 3 प्रतिशत।
- गैर लायसेंसी साहूकारों द्वारा दिये गये ऋण कानून बनाकर शून्य किये जायेंगे।
- लायसेंसी साहूकार द्वारा दिये जाने वाले ऋण पर ब्याज राशि का निर्धारण करेगी सरकार।
- पहली बार नुकसान का आकलन खेत और फसल को एक इकाई मानकर होगा।
- प्रारंभिक तौर पर राहत के लिये 500 करोड़ की व्यवस्था। जरूरी होने पर अतिरिक्त राहत राशि भी।

मध्यप्रदेश जनसंपर्क द्वारा जारी

हर कदम पर किसानों के साथ | **मध्यप्रदेश सरकार**

1102/Khariff/2011

AD>> COLAS • India

Custom made

Those who believe aerated drinks do nothing other than send adipose tissues into overdrive, spare a thought for the country's excise department. An ad issued by the department on February 21 exhorted: "Drink aerated dr-inks and do social service." It explained this unlikely way of doing social good: "Excise duty on aerated drinks is used to meet drinking water requirements of millions." B Vani, inspector at the department's directorate of public relations said: "The ad tries to inculcate awareness on benefits of paying tax. It does not eulogise aerated drinks." Vani admitted aerated drinks do harm but does not find the ad wrong because aerated drinks are not banned. ■



TRADEMARK>> JULIAN ASSANGE • The UK

Assange trademark

Julian Assange, who shot to global fame after publishing colossal amounts of classified-yet-humdrum US government data, has applied for a UK trademark on his own name. The application submitted in the last week of February by the founder of the WikiLeaks, covers "public speaking services, news reporter services, journalism, publication of texts other than publicity texts, education services, and entertainment services". It could be granted in May, provided that, nobody contests Assange™'s trademark application. There is a chance that it might be rejected because the word "assange" has become a verb: to assange is to disappear suddenly. ■





TWITTER>> DRUNK-DRIVING • Brazil

Tweet to evade cops

The microblogging site Twitter has become the setting for a battle of wits between the police and residents of Rio de Janeiro evading a drunk-driving campaign, Operation Lei Seca. Anyone who has had too many beers but wants to drive home can turn to a page on Twitter where citizens who have seen the distinctive branded police vans, warn others which routes to avoid. Traffic police are logging on to foil such efforts, often parking in unexpected locations. "The Twitter page is undermining our strategy and good sense of the campaign," said Jose Gomes, Brazil's former health minister. For some, Lei Seca is an interference from authorities. Twitter user Marcelo said the check was not just a way to drink and drive without fear of reprisal. "Lei Seca is good. At times I check Twitter on my Blackberry when I have forgotten my licence. It's just better to drive without worrying about anything." ■

SNIPPETS NEWS

>> Google has decided to demote "low-quality" websites from online search engine results. But it will give better rankings to sites with original content and information like research, in-depth reports and analysis. It has not yet specified the sites, which would be affected.

>> A new federal report shows that more than 90 per cent of nursing homes in the US employ one or more people convicted of least one crime. In addition, five per cent of all nursing home employees have at least one criminal conviction.

ONLINE

www.medialens.org

MEDIA WATCHDOG



UNTIL recently, no system of power seemed more invincible than corporate media. A century ago, industrialisation handed a monopoly of mass communication to a tiny elite with the money to buy and run printing presses and, later, TV studios. Yet through a further twist of technological fate, the digital revolution has broken the monopoly and scattered it to the four winds—cellphone camera, Twitter, bloggers, vloggers, citizen journalists and Facebook posters. The site's owners say that these four mediums are easily accessible and data can be collected faster too. The site checks media's version of events against credible facts and opinions provided by journalists, academicians and researchers. It publishes both versions and invites readers' verdicts.

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Alternatively, you may download the form from http://www.hbcse.tifr.res.in/downloads/
Completed forms should be sent latest by April 15, 2011 with two passport size photographs along with a demand draft for Rs. 350/- (non-refundable) payable at Mumbai in favour of **Homi Bhabha Centre for Science Education.**

A written test for eligible applicants will be held at six Centres around the country: Chennai, Bangalore, Pune, Mumbai, Delhi and Kolkata. For information see http://www.hbcse.tifr.res.in/graduate-school/examinfo/. Those who qualify will be called for an interview.

Phones:(022) 25580036/25072230; *Fax*: (022) 25566803; ***email***: hbcdean@hbcse.tifr.res.in

CIVIL LINES / RICHARD MAHAPATRA

ECONOMY OF SLIPPAGE

SPECIAL ISSUE WORLD WATER DAY 2011

Where did the ₹100,000 crore pumped into drinking water supply go?

India's rural drinking water supply programme has become a Sisyphean task. Every year government claims covering more habitations with drinking water provisions. But the inches of progress is negated by a phenomenon called slippage. It means fully covered habitations slip back to the not-covered or partially covered state. Over decades, this has created a situation where government spends more on retaining slipped-back habitations than on creating drinking water provisions for habitations where none exists. This may partly explain India's consistent failure in meeting deadlines for universal coverage of drinking water in rural areas.

Every year around 100,000 fully covered habitations slip back to the not-covered status. Till early 1990s India had fewer slipped-back habitations than not-covered habitations. Since early 2000s the trend reversed. The extent of slippage can be gauged from the fact that in 2005 when the Centre started the Bharat Nirman programme it had 55,067 not-covered habitations, while the number of accumulated slipped-back habitations was six times: 331,000.

While we know the reasons for slippage for sure, its socio-economic cost is yet to hit home. India's total expenditure (since Independence) on drinking water and sanitation would reach ₹100,000 crore by 2012. And since water-borne diseases are a major reason for rural morbidity, slippage also has a social cost. Interest in measuring the costs of slippage in India is growing. Those involved in such studies say this will show what a sustainable rural drinking water project would cost.

Slippage has altered the pattern of government's spending on rural drinking water programme. It spends more on slipped-back habitations than on habitations that still remain uncovered. Government data till January 2010 shows 88 per cent of the allocation for rural drinking water schemes is for creating provisions for slipped-back habitations, leaving 2.1 per cent for habitations not having access to drinking water provisions (10 per cent is for quality-affected areas).

Economists K Pushpangadan and G Murugan of the Centre for Development Studies in Kerala measured the socio-economic cost of slippage in rural drinking water coverage in India. They took into account the magnitude of slippage, number of people affected and the cost of per capita coverage in 32 states and Union Territories that had reported slippage during 1993-2002. They found the total cost of slippage for the period was ₹1,621 crore, calculated at 2007 rates.



SAYANTAN BERA / CSE

At the same time, lack of easy access to drinking water has been breeding a corrupt system. This is an enormous economic burden for the poor. In 2008, a study by the Delhi-based Centre for Media Studies in collaboration with Transparency International India found that below-poverty-line (BPL) households were spending a substantial amount of money as bribe to get drinking water. The study that covered samples from across the country found that BPL households paid ₹2,390 lakh in bribes. "Occasions for bribery were installation/maintenance of hand pumps, meter installation, pipe repair, supply of irrigation water, etc.," said the report.

As pointed out earlier, unsafe water increases health risks and accompanying expenditure. If out-of-pocket health expenses are factored into poverty measurement, rural poverty would rise by 3.6 per cent, according to an analysis by Indrani Gupta of the Delhi-based Institute of Economic Growth. She carried out the study for the Planning Commission's Expert Group on Poverty. Gupta analysed the consumer expenditure data and health expenditure data gathered through two rounds of the National Sample Survey Organisation. She found both rural and urban poverty increases when out-of-pocket health expenditures are adjusted in poverty measurement. In fact, rural poverty rises more than urban poverty. Data from both the survey rounds (55th and 61st) showed similar results. "These results indicate that out-of-pocket expenses are more poverty-inducing in rural areas than the urban, and their impact on poverty has increased over the years," states the analysis.

Slippage is not a new phenomenon but it has become more pronounced. This indicates fundamental problems in the way we design our programmes and policies. The guidelines for the national rural drinking water programme adopted in 2009 did recognise the problems. The biggest problem is that water sources are either drying up due to less recharge of groundwater—it meets 85 per cent demand—or water is not available round the year. Going by government's own reasoning, 40-50 per cent of the slippage happens because of this reason. But these sources invariably do not come under the department of drinking water supply. To curb slippage and the huge socio-economic cost, the rural drinking water programme must seek convergence with conservation of water sources. ■

BE > THINK > INNOVATE >

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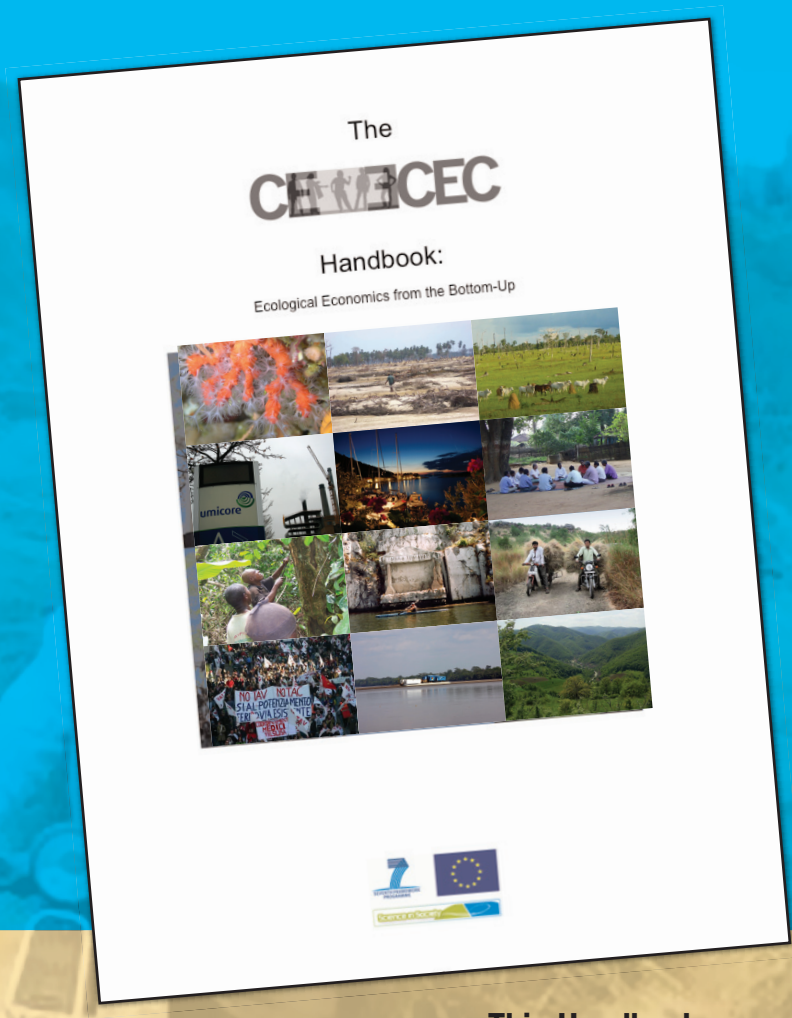


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This Handbook, comprising of 14 chapters and a glossary, is the product of collaborative efforts between environmental activists and ecological economists from around the world.

The resulting chapters are the product of cooperatively written case studies of environmental conflict, real examples through which the concepts and tools of ecological economics are taught from the bottom-up.

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