

SCIENCE AND ENVIRONMENT FORTNIGHTLY

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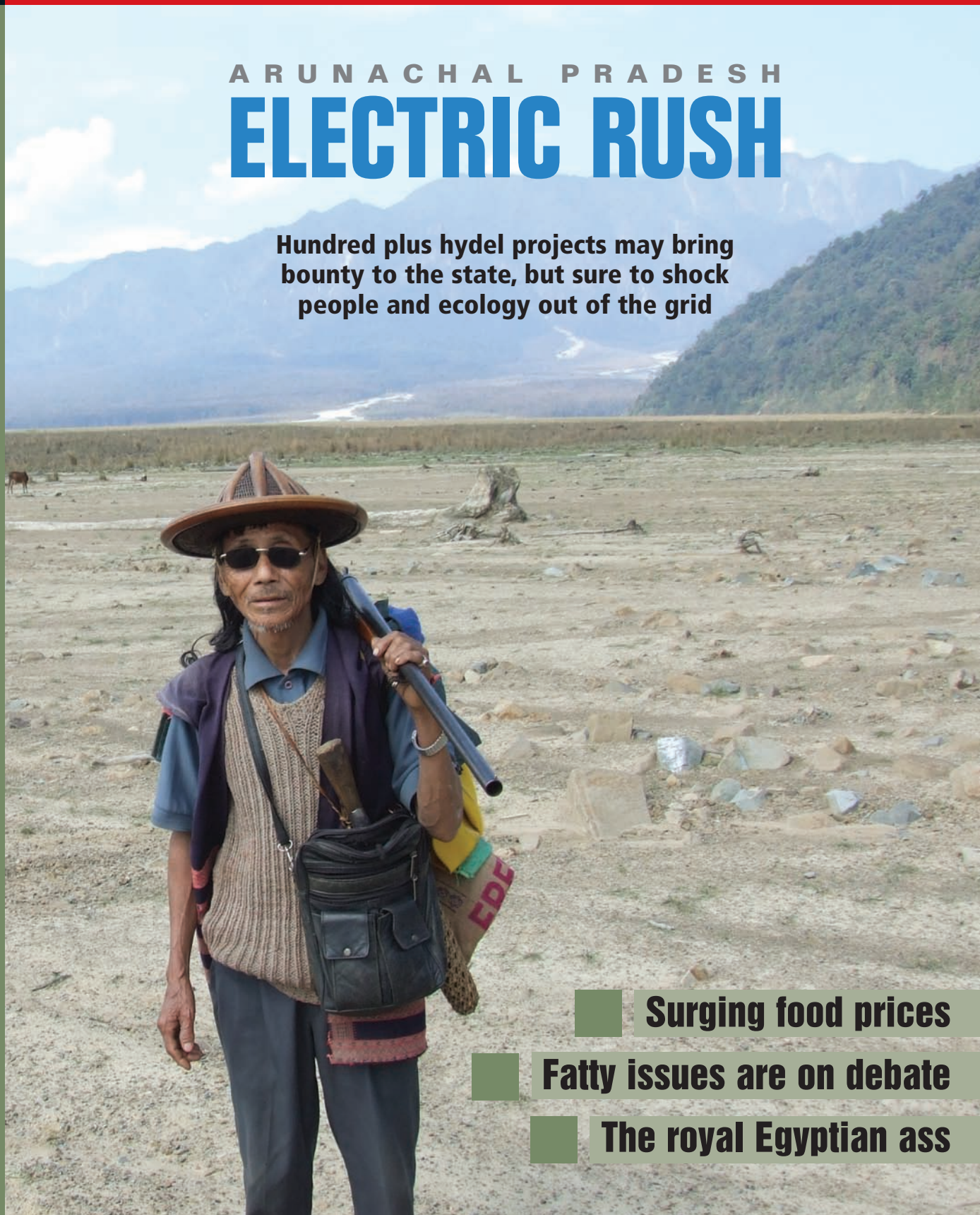
Down To Earth

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ARUNACHAL PRADESH

ELECTRIC RUSH

Hundred plus hydel projects may bring bounty to the state, but sure to shock people and ecology out of the grid



Surging food prices

Fatty issues are on debate

The royal Egyptian ass

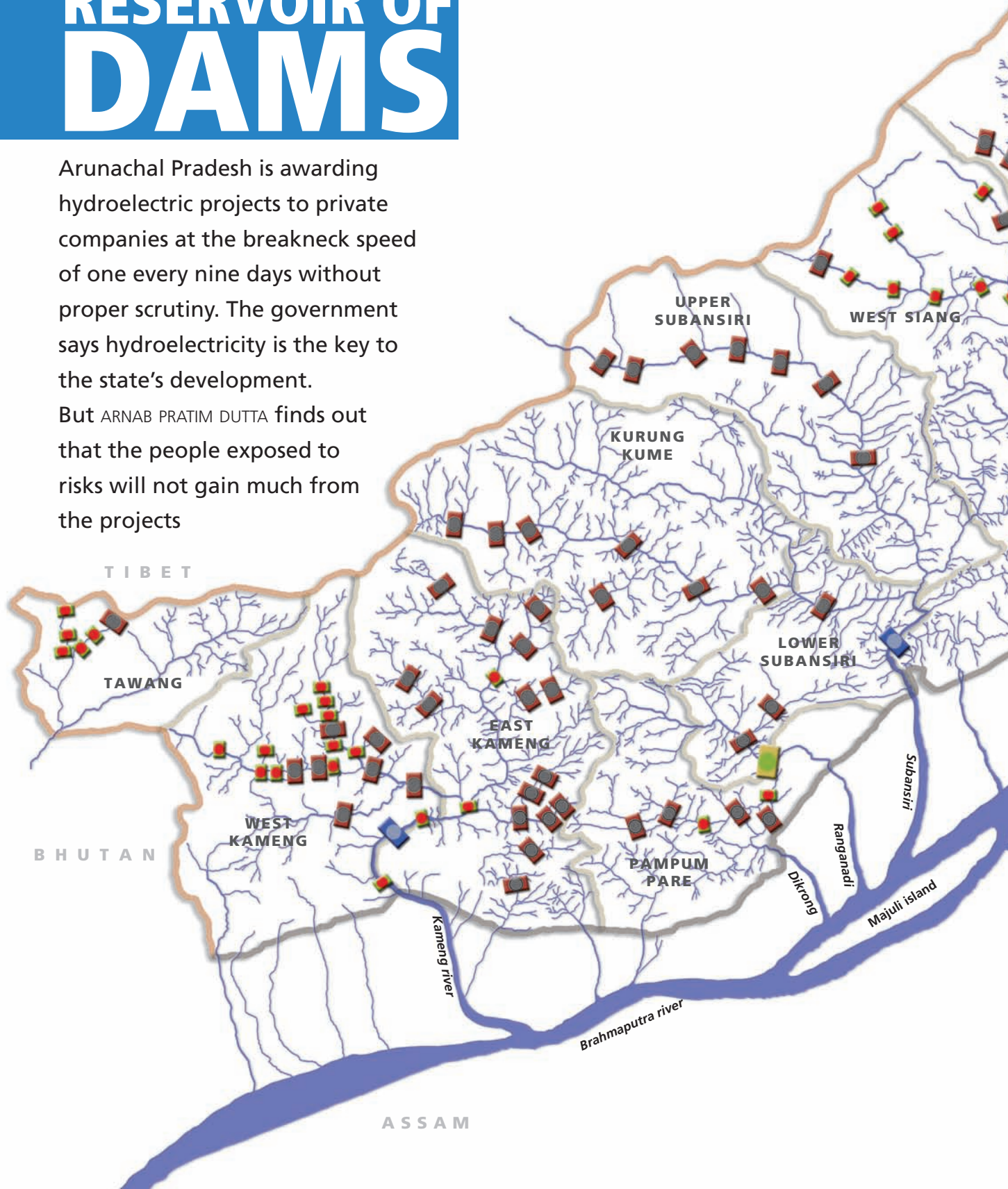
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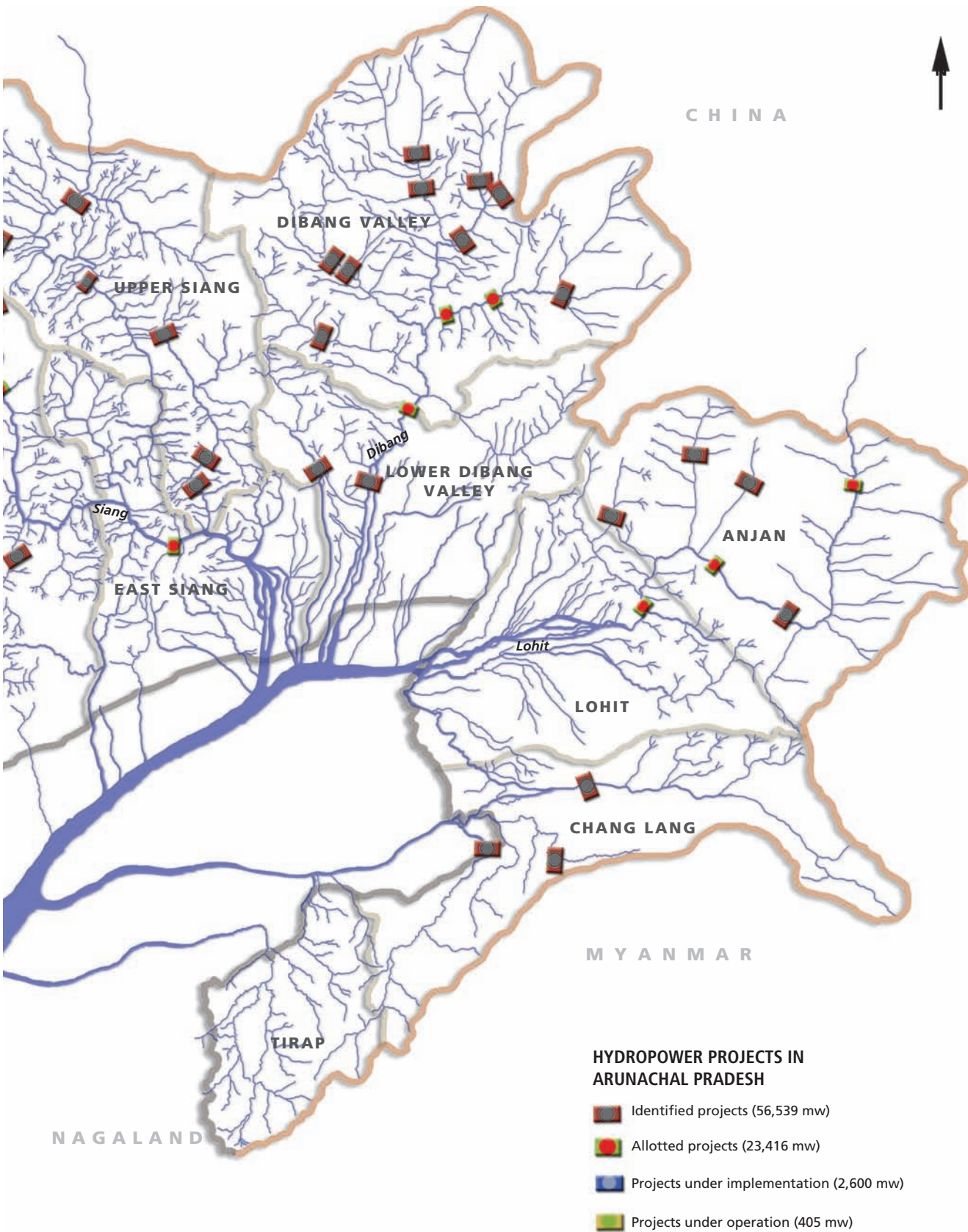
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RESERVOIR OF DAMS

Arunachal Pradesh is awarding hydroelectric projects to private companies at the breakneck speed of one every nine days without proper scrutiny. The government says hydroelectricity is the key to the state's development.

But ARNAB PRATIM DUTTA finds out that the people exposed to risks will not gain much from the projects





Once you reach Lower Dibang Valley in Arunachal Pradesh, you know you have stepped into the shadowy side of “shining” India—the cell phone stops catching signals, the roads are worn out and the electricity supply, erratic. If you drive 40 km out of its district headquarters Roing to Nizam Ghat and then trek for three hours in Mishmi hills, you will reach Pather Camp, a nowhere destination in absolute wilderness. A helipad is the last thing you will expect here. Yet there it stands, a testimony to the importance of this place. Pather Camp is where India’s biggest dam, the Dibang Multipurpose Project (DMP), is proposed to come up.



PHOTOGRAPHS: ANJANA PRATIMA DUTTA / CSE

Dams are a big idea in Arunachal Pradesh, touted as the open sesame to the state’s financial prosperity. They have the resonance of both promise and apprehension. Promise because they can be the harbinger of development—one paisa per unit of power the 3,000-mw DMP will generate is promised to be spent on local development. And apprehension because the people fear that dams will pave the way for the government to take over the control of natural resources or worse, ruin them—they opposed DMP at a public hearing in January, and stalled the next hearing in March.

Hydroelectric projects are also a big booming business in the state. In just 11 months from April 2007 to February 2008, the Arunachal Pradesh government signed agreements for 38 projects with private companies. That is three-and-a-half projects a month or a project every nine days. Many of these companies have no expertise in building dams.

Where will it stop? The government plans to erect 104 hydroelectric projects in the state, with a cumulative generation capacity of about 56,000 mw—one-third of India’s hydropower potential. It has smelt a cash cow in these projects. “If the available potential (hydropower) can be harnessed, the state will be floating ‘Hydro Dollars’” like petro dollars in Arab countries, says the state hydropower policy. The Arunachal Pradesh government estimates that mega hydropower projects planned in the state can augment its annual income by up to Rs 8,000 crore through the sale of its share of electricity—the 2008 state budget was Rs 2,065 crore.

A senior official of the Arunachal Pradesh government, who prefers to remain anonymous, says the government wants to generate most of this power in the next 12-14 years and, therefore, it is in a hurry to allot projects to private developers.

From a trickle to flood

According to the official, private players entered the hydroelectric sector in 2005. In April that year, the prime minister announced the North-East Water Resource Authority on the lines of the US Tennessee Valley Authority as an independent corporation. This authority had the World Bank’s support. While all the six other states of the Northeast accepted the draft proposal for setting up the authority, Arunachal Pradesh opposed it. Recognizing the authority would have meant placing the rights to river systems under its control. The then Arunachal Pradesh chief minister, Gegong Apang, instead came up with the state’s Hydro Power Policy in November 2005.

With the hydropower policy in place, Apang initiated private developers in the sector. Public sector units like the National Hydro Power Corporation (NHPC) began to lose projects allotted to them by the central government. In 2005-06, five mega projects, for which the detailed project reports had been prepared or were being prepared, were given to private firms. Siyom (1,000 mw) and Tato-II (700 mw) went to Reliance Energy; Hironag (500 mw) and Lower Siang (1,600 mw) to Jaypee Associates; and 1,000 mw Naying to DS Constructions, a real-estate developer and hydropower contractor.

The next year nine agreements for projects with the total generation capacity of 4,425 mw were signed with Bhilwara Energy, little-known Mountain Fall, KSK Electricity Financing and GMR Energy. By then a political turmoil was brewing. In April 2007, Apang had to step down as chief minister and power minister Dorjee Khandu took over. According to informed sources, Apang had to quit, not because of any discord with his MLAs, but for not obeying the centre and opposing large storage dams (see box: *Big trouble*).

MoUs do not fix responsibility for damage caused by dam break

Since the power shift the trickle of MoUs has turned into a flood. Thirty-eight more agreements were signed by February 2008, bringing the total MoUs with private developers to 52 (see table: *Taming rivers*). The combined installed capacity of these projects is 14,289.5 mw. Besides, seven projects have been awarded to public sector units, NHPC, National Thermal Power Corporation (NTPC) and the North Eastern Electric Power Corporation (NEEPCO).

Free for all

What were the criteria and methodology for selecting power developers? There is no transparency. A glance at a notice inviting bids for three hydroelectric projects by the state government on September 25, 2007, reveals that companies wishing to invest in hydropower in the state need not have any experience in building such projects. The only techno-economic requirement the government sought for constructing the mega Hatung II, Kalai I and Bharali II projects was that the “bidders should have a strong financial and technical base and adequate free reserves and surpluses and requisite technical capability”. There were no specific guidelines for determining the bidder’s technical strength or experience in building dams.

The three projects were allocated to Mountain Fall India, a

company unheard of in the power and infrastructure sector. KSK Electricity Financing, Indiabull Real Estate, Raajratna Metal Industries and Energy Development Company are other companies which have no experience in building dams but have been allotted projects. What's more, the MoUs completely overlook safety concerns. There is no clause in the agreement fixing responsibility for the damage caused by dam break in case of earthquake or landslide, although Arunachal Pradesh falls in high seismic zone and is landslide prone.

A senior official in the state power department admitted that most bids by private proponents do not go through any scrutiny and the projects are awarded on the basis of the upfront payment and the free electricity they promise to the state. Reliance Energy, DS Constructions and Jaypee associates, for example, promise 12 per cent free electricity for 10 years and 15 per cent thereafter, much more than public enterprises.

Says Bamang Anthony of the Arunachal Citizens Rights: "Any company willing to pay an upfront payment can set shop in Arunachal Pradesh." A private company has to pay a non-refundable processing fee of Rs 10,000 per mw of the project's installed capacity and a lump sum amount of Rs 21,000 per mw. For the 1,000 mw Siyom project, Reliance Energy paid a processing fee of Rs 1 crore and an upfront Rs 2.1 crore. The government is said to have hiked the upfront payment recently. "In other words," says Anthony, "the government has committed to these projects before any assessment or clearance." Despite repeated queries, the state power secretary did not comment. Until December 19, 2007, the state had collected an upfront payment of Rs 158.64 crore for 35 projects. NHPC has given a soft loan of Rs 225 crore for DMP. This money is being used to bail out scam-hit Arunachal Pradesh State Apex Bank.

Lure of money

The government, however, does not tire of saying that it needs the money from hydroelectric projects for building physical and social infrastructure in the state. The chief minister, in his

Taming rivers

River Basin	Number of probable projects
Dibang	17
Siang	16
Lohit	9
Tawang	6
Subansiri	25
Kameng	29
Upper Brahmaputra	2
Total	104

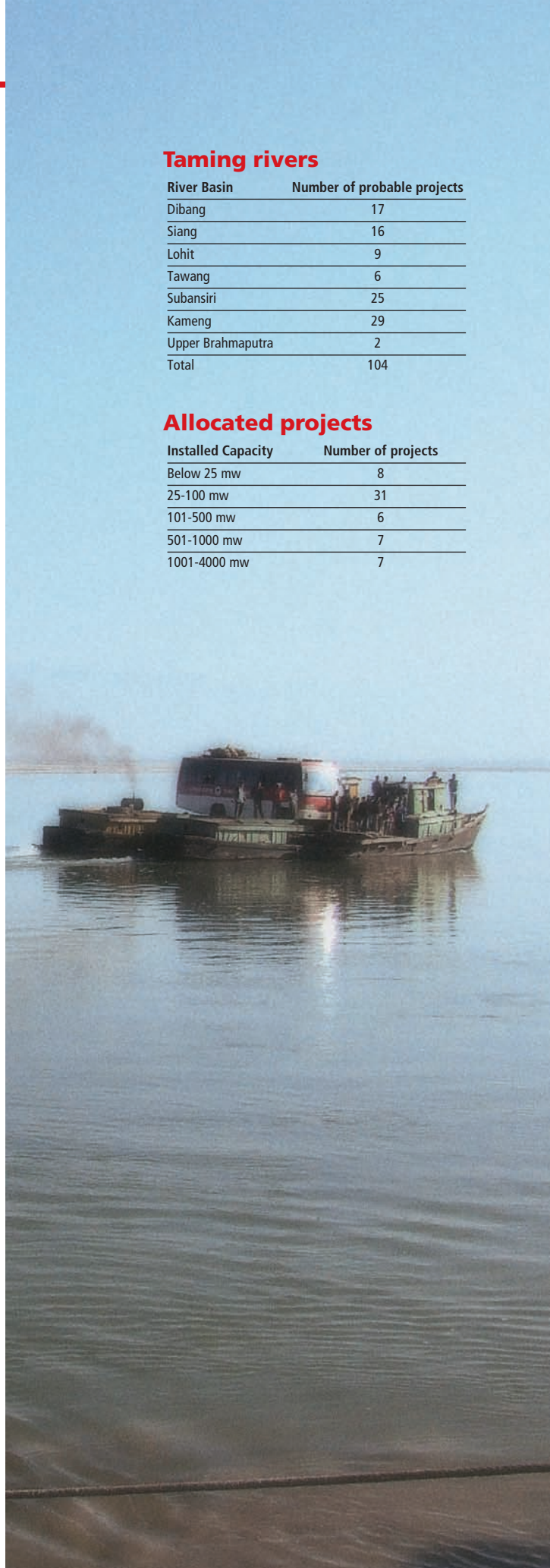
Allocated projects

Installed Capacity	Number of projects
Below 25 mw	8
25-100 mw	31
101-500 mw	6
501-1000 mw	7
1001-4000 mw	7

Big trouble

In May 2005, the Arunachal Pradesh government filed an application in the Supreme Court regarding the Subansiri (Lower) project, expressing serious concerns about large storage dams: "... the adverse effect of the mega power projects on the environment cannot be overlooked. Storage projects like the Subansiri (Lower) may not be ideally suited for the state of Arunachal Pradesh due to the possibility of massive earthquakes, fragile geological conditions, needs to preserve rich flora and fauna in the state, sentiments of the tribal people who may have to be displaced/relocated."

Again at a meeting of the representatives of the seven north-eastern states and the centre organized by the World Bank and the Department of Northeast Region in June 2006, the then chief minister Gegong Apang made it absolutely clear that his government would promote only run-of-the-river projects and would consider high-rise dams only if the communities were not affected.





presentation at the National Development Council meeting on December 19, 2007, said the state generated little revenue on its own. Arunachal Pradesh's annual per capita income is Rs 19,566 (2003-04), which is less than the national average. Half of the villages in the state do not have electricity. The road density is 21.8 km per 100 sq km, against the national average of 76.8. The coverage of national highway is even more dismal at 0.5 km per 100 sq km, one-tenth the national average.

Under such circumstances, the government says, a project like DMP can provide the state exchequer Rs 300 crore annually or 15 per cent of the state's annual revenue. In January this year, the prime minister also said that with some of the mega hydroelectric projects in place, Arunachal Pradesh could generate between Rs 3,000 crore and Rs 4,000 crore annually. The

Project disaster

Heed to the warnings of ill-planned approach

Challenges thrown up by the Ranganadi Hydro Electric Project (RHEP) stage I, commissioned in 2002, are lessons to be learnt by the state government and the project proponents. The project involves transfer of water from the Ranganadi, a tributary of the Subansiri, into the Dikrong, which merges with the Brahmaputra. A diversion dam is located at a place called 41 KM near Yazali town in Lower Subansiri from where 160 cumecs of water is diverted through 8.5 km-long tunnels to a power station at Hoz on the Dikrong. The plan was to release this water to generate 405 mw of electricity but the power station has failed to meet the target.

DIMINISHING POWER

Project proponent NEEPCO maintains that RHEP was commissioned with a partial generation capacity of 172.4 mw. Even this has not been attained. Only in 2004-2005 did the power station generate more than 172 mw. In 2006-2007, generation fell to 109.4 mw, claims NEEPCO's annual report. But the actual power generation may still be less. According to a senior official of the state power ministry, RHEP is providing the state only 8 mw. "Since 12 per cent power is given free to the state and we get 8 mw from this project, it calculates to 67 mw of electricity generation," the official said.

When *Down To Earth* spoke to NEEPCO, the officials claimed they were producing at par with the 'design energy' (172.4 mw). The corporation's report for 2006-2007, however, tells a different story. The generating units of the hydropower station had to be shut down for 78 days between November 8, 2006, and January 25, 2007, due to leakages in the tunnels diverting water from the Ranganadi.

INCOMPLETE REHABILITATION

The rehabilitation plan for the project drawn up in 1989 had claimed that people would not be directly displaced by the dam, but when the project was completed, 30 families living on the bank of the Ranganadi were displaced.

These families were later rehabilitated 25-30 km away, at Potin, a small stopover on the way to Ziro, the headquarters of Lower Subansiri district. The resettlement colony at Potin is a little above the road. When *Down To Earth* visited the site in March, the government was constructing the approach road to the colony, which, the

state's hydropower policy, however, does not promise that this money will be used for the benefit of the affected people.

Politicians claim that the projects will also benefit the people directly. "DMP is integrally linked with the development of the valley," says Lata Umbrey, MLA, Lower Dibang Valley. All grade III and IV jobs and 25 per cent executive posts in the project are reserved for the residents of the valley, he says.

Possible threats

With the potential are associated possible threats. Arunachal Pradesh is in a high seismic zone and the silt load in its rivers is also high. "The lower Himalayas are young and geotectonic activity is still very strong in the region. They are also prone to landslides and geological upheavals, hence any development

activity warrants careful and studied interventions," says Dulal Goswami, former head, Department of Environment Sciences, Gauhati University, Assam. There has been no basin-wise study to gauge either the ecological, social and technical difficulties, or rivers' carrying capacity, says Neeraj Vaghlikar of NGO Kalpavriksh. In January and February, the Expert Appraisal Committee on River Valley and Hydroelectric Projects of the environment ministry ordered basin studies on the Kameng and Lohit rivers. "But there is a clause in the order that individual project clearances will not be subject to these basin-level studies," says Vaghlikar.

DMP developer NHPC has refused any compensation in case of a dam break to people. Asked if the government had done any study to assess the overall impact of all the dams in the

settlers say, was part of the original deal with NEEPCO.

The rehabilitation scheme involved social benefits like schools, a 20-bed hospital, free electricity and jobs and contracts to the displaced. Only six people have got jobs, says Taba Tazo, one of the displaced who owns a hotel in Potin. "NEEPCO promised a lot, but delivered little. The school was built but did not have any teachers, houses were there but of very poor quality," says Jimmy Likha of the Yazali-based Land Affected People's Forum. Tazo shares similar sentiments: "We did not get the promised free electricity." Some families have left because of poor living conditions.

DOWNSTREAM IMPACT

People living downstream of the diversion dam are worse affected. Kimin, a small settlement 30 km away in Papum Pare district, has to put up with unsystematic management of the river. If the release of water during the summer months has been a problem, then during the winter months the river goes completely dry as almost all the water is diverted to the Dikrong for electricity generation. Agriculture is suffering and several animals have been killed because of unregulated flow in the Ranganadi and lack of warning system, say Kimin residents.

NEEPCO brushes aside any responsibility for the problems downstream. In a July 2006 notice to the villages it said: "... during monsoon ... the gates of the Ranganadi Diversion Dam may require opening from time to time All concerned authorities, village headmen are therefore requested to bring the same to the notice of all villagers ... downstream of the dam to refrain from going to the river and ... also restrict pet animals from moving around the river/reservoir during the monsoon period. The corporation will not take any responsibility for any loss of life of human, pet animals etc."

Says Tana Pinji, president, Lichi Cher Ranganadi Project Area Committee, an organization looking into problems of downstream villagers: "The circular violates the basic rights of the people. We are dependent on the river for everything, but not they tell us to stay away from it. This is unjustified and insulting."

Flash floods are a major concern. On July 16, 2007, flash floods swamped 83 villages in Lakhimpur district of Assam. The next day Assam's Minister for Flood Control Bharat Narah accused NEEPCO of opening the dam gates and causing floods. The corporation, however, attributed floods to a cloudburst.



RIVERS ARE NOT THE SAME

A 2002 study by Aranyak, an NGO working on biodiversity in Assam, has revealed that diversion of water from the Ranganadi to the Dikrong has meant that the Ranganadi is reduced to a trickle during the winter months, while the additional amount of silt carried by the diverted water has raised the Dikrong riverbed. The study, commissioned by the Bombay Natural History Society, says the Dikrong riverbed between Doimukh and Badati in Assam, where it joins the Subansiri, has risen by 2.5 m from the 1972 level.

The Ranganadi, which used to receive 170-200 cumecs during the winter months, now gets less than 40 cumecs. The study warns that from the dam site to Ranganadimukh, where the river joins the Subansiri, the river will dry up in the winter months. This could affect groundwater recharge and lead to deposition of heavy amounts of debris at the confluence and a shallower bed. The river will "braid more and flow in multiple channels" and in the flood season it will engulf more area and make floods more disastrous, the study warns.

state, R Kemp, conservator of forest, said: "No."

"When DMP's environment impact assessment (EIA) report itself says that due to high seismicity in the region the reservoir should not be filled to its capacity for the first few years, then how will they generate the peak power?" asks Mitai Lingi, president, Idu Cultural Literary and Society, Roing. He has reasons to doubt. The only operating project in the state, Ranganadi Hydro Electric project (RHEP) stage I, in Lower Subansiri district is generating much less than its installed capacity (see: *Project disaster*). Nor have these project developers taken into consideration the impact of melting of glaciers and silting of reservoirs. High discharge of silt could affect the power production of some dams, says Arup Saikia, geologist with Rural Volunteer Centre, an NGO involved in flood control in Assam.

The DMP reservoir will also submerge over 5,000 hectares (ha) of forest, and NHPC will have to acquire community forest land for compensatory afforestation, which means more displacement and resource alienation (see 'Truth is more slippery', *Down To Earth*, April 15, 1999). With 17 projects planned on the Dibang, communities in the region could end up losing most of their land.

Then there is the threat of migrant labourers disturbing demography. A 2,000 mw project, Subansiri (Lower) is using about 12,000 labourers. Bigger projects like DMP may hire more labourers, although its EIA talks of only 5,000. Seventeen projects planned on the Dibang mean over a lakh labourers visiting the area, while the local population, comprising Idu Mishmis, is only 12,000. The Arunachal Pradesh government has not done any study to look into possible social conflicts.

River management is another concern. Diversion of water from the Ranganadi to the Dikrong for RHEP is not only affecting the people downstream of the dam but also changing the nature of the rivers. "A thousand are affected by unsystematic management of the river. Nearly 20 ha of land has become uncultivable due to lack of water," says Takio Taram, a resident of Kimin, a settlement 30 km downstream of the dam.

Further downstream, Assam too is feeling uneasy. There has been no formal study on the impacts of the dams on the lower riparian state. In December 2006, after the All Assam Students Union (AASU) agitated against Subansiri (Lower), the Assam government directed NHPC to conduct a study on the project's downstream impacts but nothing happened. After several ultimatums by AASU, the Assam government, NHPC and the students'

No study of the overall impact of dams in Arunachal Pradesh

union set up a committee of experts from IIT Guwahati, Gauhati University and Dibrugarh University in September 2007 to look into the project's impacts. NHPC was to finance the study. Jatin Kalita, professor of zoology at the Gauhati University, who is the coordinator of the committee, says NHPC has not yet sanctioned the study budget, hence the delay. According to Assam power and industries minister Pradyut Bordoloi, the government is ensuring the state at least gets some benefits. "We've negotiated with NHPC to provide us 6 per cent free power from Subansiri (Lower)," he says. The governments seem too distracted by the jingle of coins to address the concerns.

DISQUIET IN DIBANG

Project overlooks many issues, miffs people

COURTESY: VERACITY

Resentment is brewing over the Dibang Multipurpose Project in Lower Dibang Valley. People complain their voice was suppressed at a public hearing in Roing in January this year. When the prime minister laid the foundation stone of the 3,000 mw project on January 28 some 600 km away in Itanagar, it further angered them because the project is yet to get clearance from the union Ministry of Environment and Forests. They blocked the road to the venue of the next public hearing on March 12, New Anaya near the project's submergence area, removed a portion of the bridge over the Dibang and clashed with officials.

Raju Mimi, member of the Idu Mishmi Students Union, asks what's the point of consulting them when the government has already decided to give the project its clearance. "There are major deficiencies in the Environment Impact Assessment (EIA) and the Detailed Project Report (DPR), and yet the prime minister decided to inaugurate the project," he says.

A joke called EIA

According to Mitai Lingi, president, Idu Cultural and Literary Society, EIA is replete with factual mistakes about the vegetation and wildlife of the area, and is based on improper rainfall data and incomplete geological studies.

Environmental activist Anwaruddin Choudhury, who has studied EIA chapters related to biodiversity, says although the world knows only one tiger species, the report claims that different species of tigers are sighted in the area. The list of avifauna borders the ludicrous. Thrush is written as thrash, woodpecker as wood packer, flycatchers have become flying catchers, fantail has become fanter and testia is spelt as testia/tortia. EIA also talks about an unheard of bird species, Brown Pied Hornbill, two unknown species of king cobra *Ophiophagus acula* and *Naja hanah*, and a new species of python, *Python aculetes*.

ELAS of Kameng and Subansiri (Lower) are also full of such mistakes. One reason behind these shoddy reports is that the biodiversity of the area is hardly explored and documented. Ipre Mekhola, wildlife warden of Ezengpo village, says over 60 per cent of the forest in the area are under community reserve.



"The state forest department has no idea about the biodiversity there. Most of the area, including the submergence zone, remains unexplored. Only local people know the faunal diversity, but they have not been consulted," Mekola says.

Saroj Barik, professor of botany at the North Eastern Hill University, Shillong, has found similar inaccuracies. He says the value index of tree species, indicating the economic importance of forest, has been calculated using wrong methods and the list of algae is full of errors. "Sargassum is a marine algae. I am surprised to find it in the list for the Dibang river," he says.

Losing land

The project will destroy 5056.5 ha of forest. According to a forest department official in Roing, Lower Dibang Valley has only 1743.5 ha of degraded forest which can be taken up for afforestation. Less than 40 per cent of the forest in the district is with the forest department, the rest are termed unclassified forests and are controlled by the community. "There is no other land in the Dibang valley for compensatory afforestation," he said, adding that the government is planning to take up community forest land for afforestation on the lines of joint forest management.

Classification of land in Arunachal Pradesh is virtually non-existent. So much so that the communities control not just forest but also rivers. Lingi says the hydroelectric projects would mean the government will start gaining a control of resources hitherto managed by the people.

Downstream discontent

Sirang, a village 35 km downstream of the dam, is also opposing the project. Sirang has 356 ha under paddy cultivation and 25 families with average landholding of 15 ha each. These families are demanding that EIA should include a compensation package for them in case of a dam break or floods caused by the dam. Muluku Tacho, chairperson, Sirang Village Committee, wrote to NHPC regarding their demand but the corporation did not agree to it. Senior NHPC manager J C Sarkar, in his reply on August 14, 2007, said the people living downstream could not be compensated because their property had not been acquired.

According to Dhiman Pareja, general manager projects, NHPC, it is for the state government to ensure that downstream people are removed from the banks.

Those living in the submergence zone also feel short-changed by the project. According to Paha Mimi, chairperson, Dam Affected Citizen's Committee, six rope suspension bridges and a steel arch bridge across the river will be submerged once the reservoir attains the level of 545 metres. "These bridges are our lifeline, but find no mention in either DPR or EIA," Mihi says. He claims that the Environment Management Plan has shown 10 villages, which will be fully affected, as partially affected.

FLAWED APPROACH

In its headlong rush to float "hydro dollars", Arunachal Pradesh has invested little in planning and risk assessment. When there are several dams coming up on a river, their impacts cannot be studied in isolation—one project will definitely disturb the other's calculations. The governments, both in the state and at the centre, must consider the cumulative impact of all the projects on the people and the environment. And for any meaningful assessment it should first document its wealth of wildlife and glaciers. Instead what the government has done is put the cart before the horse—it has told the project developers to go ahead before any comprehensive basin-wise study is done. And this in a state which is geologically fragile. The impacts of the Arunachal Pradesh government's grandiose hydel aspirations are likely to resonate through the entire region. People in downstream Assam have already made their displeasure evident.

An ill-planned approach to harnessing hydropower potential can have disastrous results. It is the people who will have to bear the brunt. While their risks are maximized, there is no assurance that the revenue generated by hydroelectric projects will be channelled back to them. Without distribution of benefits development is but hogwash. ■