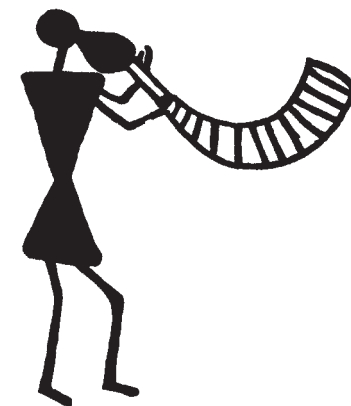


The illustrations for this article were done by artists of the indigenous Warli tribe of Maharashtra, north of Bombay. They illustrate folk stories based on the activities of traditional village life, as identified on each page. Above: Tree of life. Facing page: Piper calling villagers to dance.

What Does India Want?



The government in New Delhi sent a defiant message when it began setting off nuclear bombs in May. But hundreds of millions of Indians, if they had a voice, might have sent a very different message. The threat they feel most acutely—the destruction of their natural support systems—does not come from Pakistan or China but from within their own country.

by Payal Sampat

It's safe to make just one generalization about India—which is that every other time you generalize about India, you're probably wrong. With over 400 living languages, 85 political parties and a 5,000-year-old cultural and intellectual history, India is defined by its heterogeneity. "All the convergent influences in the world run through this society," wrote historian E.P. Thompson. "There is not a thought that is being thought in the West or East that is not active in some Indian mind."

Perhaps the most noted modern representatives of this diversity of thought were Mahatma Gandhi and Jawaharlal Nehru, who worked together in the first half of this century to get the British to "quit India," but differed sharply in their vision of what an independent nation should look like. At that time, their debate pertained only to the future of a former colony facing the challenges of self-governance. Today, the echoes of that famous debate still resonate—now in the accelerating development of the second-most populous nation, and with large implications for the world as a whole.

Nehru aspired to make India a leading industrial society, a *force to reckon with* in the global economy; it would be powered by modern machinery and giant dams—he called these the "new temples of modern India." Gandhi's hope, in contrast, was to strengthen India's grassroots village economies by promoting local self-reliance, and by using what would today be called "appropriate technology"—the kind of tool that increases a worker's productivity, but does not devalue or replace him.

In recent years, the intellectual successors to Nehru and Gandhi have polarized the issue in a way those early leaders may never have intended. The debate has taken different forms in the half-century since India's independence in 1947, but the tensions it expresses—over modernism and tradition, globalization and community, economic prosperity and voluntary simplicity—are now as familiar in Mexico, Nigeria, and Japan as they are in India.

Giving added urgency to the debate today is the fact that these issues are matters not only of political philosophy, but also of biological and economic sur-

vival. India's physical environment is deeply threatened, and so, as a result, are the one billion people and the economic activities that it supports. At a time when homogeneous prescriptions for economic development are being called into question, the sprawling diversity that has kept people debating for the past half-century may hold answers for India's biggest challenge yet: balancing the needs of its people with the natural systems that sustain them.

Fifty Years in the Making

At the time the British left India in 1947, the newly independent nation faced human deprivation of staggering dimensions. Nehru, as the nation's first prime minister, guided the country's development along the lines of the Soviet Union, a model that suited both his industrial aspirations and the need to overcome this poverty. Like the state planners of China and the Soviet Union, Nehru envisioned development on a grand scale. His government and its successors undertook an ambitious, ongoing campaign to construct dams, transcontinental highways, and nuclear power plants. Unlike the Soviet and Chinese regimes, however, the Indian government encouraged private ownership. In keeping with its long tradition of ideological plurality, it embraced a "mixed economy": although the state controlled some key sectors (electricity utilities, telecommunications, aviation, and mining, among them), private enterprise continued to be a vital part of the economy.

While Nehru's vision prevailed most visibly, Gandhi's ideas shaped the economy as well. His idea of *swadeshi*, putting emphasis on things "indigenously produced," played an important role in India's freedom struggle, and has strongly influenced India's economic philosophy—and its citizens' psyche—ever since. The idea was to empower ordinary people by fostering pride in what they produced themselves, and by encouraging self-reliance through activities like spinning cotton and growing food for their own consumption. By extension, *swadeshi* led to a policy of national self-sufficiency in food production. However, the means that were used to enact this policy—the "Green Revolution" with its heavy dependence on mechanization, agrochemical applications and centralized seed banks—had a decidedly Nehruvian spin. While bureaucrats in New Delhi have continued their pursuit of large-scale development, much of Gandhi's legacy has evolved in less conspicuous venues—in the rural villages and in India's 25,000 non-governmental organizations and grassroots movements involved in environmental and social reform.

Over the past decade, a third voice—promoting free-market policies—has been introduced to the old debate, and has brought rapid changes. The shakeup

began in 1991, when India's economy faltered. A weak monsoon that year hit farmers hard. Since agriculture is the backbone of the Indian economy (providing a third of the country's GDP and 70 percent of its jobs), the blow to agricultural growth sent repercussions throughout the economy. Later that year, the Soviet Union disintegrated and India lost its primary export market—and oil supplier. India's GDP, which had grown at about 5.5 percent per year throughout the 1980s, flattened to a growth of less than 1 percent in 1991. At the time, the country owed \$90 billion in foreign loans it had taken out to finance its many infrastructure projects. With under \$1 billion in foreign reserves, India found itself in a dangerously vulnerable position.

At that point, the International Monetary Fund stepped in with an offer to bail India out—on the condition that the country abandon its socialist planning for free-market policies. Like several other developing countries around the same period—Mexico and Vietnam, for example—India agreed to "liberalize" its economy: to reshape its laws to encourage foreign investment, to privatize certain state enterprises, and to dismantle trade barriers that protect domestic industry. These reforms met with hostility in a nation built on the concept of local self-determination. But economists, who had long complained about the inefficiencies of their country's protectionist policies, were relieved that India was finally poised to become a competitive force in the global economy.

Draining Groundwater

In the 50 years since its independence in 1947, India's economy has grown ninefold. While its population in that time has doubled, its grain production has nearly quadrupled—on the surface, an extremely good ratio. And during the same period, the country's electricity generation capacity has expanded 50 times. But much of its material progress has neglected—and often come at the devastating cost of—the natural resources that have fueled it.

In its efforts to jumpstart industry and agriculture, India offered virtually free access to those natural resources—fresh water, forests, and minerals—that are the basic materials of a modern industrial economy. It offered high energy subsidies for electricity and diesel fuel. (Electricity subsidies amount to 1.5 percent of India's GDP.) It assumed the costs of expanding roads and railways into previously remote areas, making it cheaper and easier still to take

out timber and other resources. These subsidies have allowed increasingly wasteful use of these resources.

This imprudence appears particularly costly in the way India has squandered its freshwater. Highly subsidized electricity rates have encouraged the extraction of increasing quantities of water from underground aquifers. During the 1960s, the Green Revolution spurred a huge increase in the use of shallow tube-wells, whose numbers have grown from 360,000 to 6 million in the last thirty years. (Robert Repetto, an economist at the World Resources Institute, has dubbed this development "the tube-well revolution.") With that many punctures in its skin, it's not surprising that India is dehydrating at an alarming rate: the country's National Environmental Engineering Research Institute reports that in several states groundwater is being drawn faster than its rate of recharge. Farmers in semiarid northern Gujarat say they have to lower their pumps by 3 meters every two years to keep up with falling water levels. Most notably, in some parts of Punjab and Haryana, the "breadbasket" of India where almost a third of the country's wheat is grown, water tables have fallen over 4 meters in the last decade.

In some areas, much of the water that is extracted is not efficiently used: according to the Tata Energy Research Institute in New Delhi, 45 percent of all irrigation water (mostly from canals) seeps through unlined field channels. Some of the seepage causes waterlogging, depriving plant roots of oxygen and reducing their productivity. In warm areas, most of the water evaporates, leaving excessive salt deposits in the soil, rendering it less productive still. As a result, some 10 million hectares are now salinized; another 12 million hectares are waterlogged.

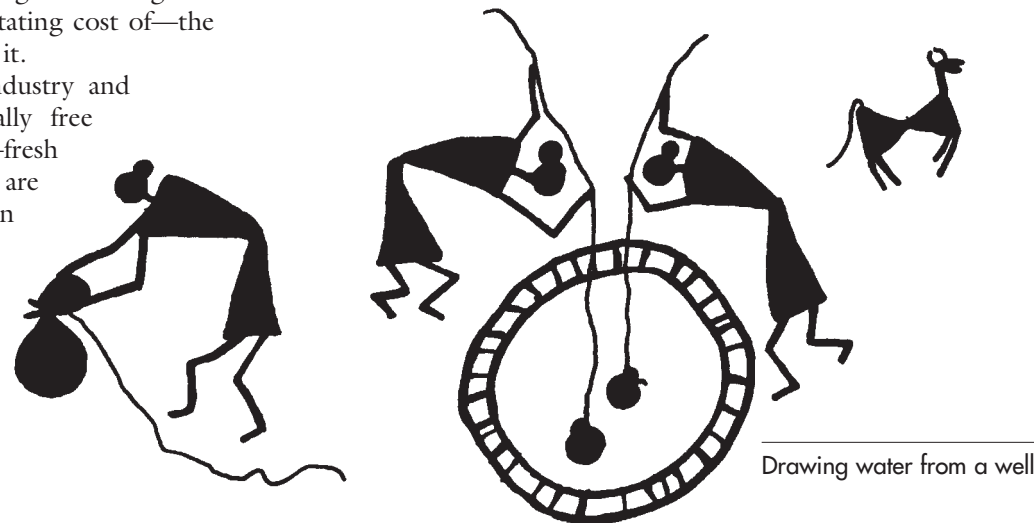
Meanwhile, traditional techniques of water harvesting that were tailored to regional variations in rainfall and water availability have been cast aside. Until about a century ago, the southern city of

Bangalore obtained its water from an intricate system of interconnected stone tanks that capture rainfall runoff. These systems also irrigated surrounding farmland. Now India's fastest-growing city and high-technology capital, Bangalore has built football stadiums and apartment buildings over some of its tanks, reports the New Delhi-based Centre for Science and the Environment. The water for Bangalore now has to be carried from the Cauvery River, which means lifting it 1,000 meters in elevation and transporting it a distance of 100 kilometers. It now costs more to supply water to Bangalore than to any other city in South Asia (although Bangalore's residents foot just 5 percent of this bill), and shortages have become routine.

Several other regions also experience chronic water shortages. Every day, diesel-fueled tanker trucks haul water to the city of Madras in the southern state of Tamil Nadu. (Groundwater levels in Tamil Nadu reportedly fell between 25 and 30 meters over a decade due to overpumping.) Even heavier costs have been exacted in western India, where 30 large dams, 135 medium-sized ones, and 3,000 small dams are planned on the Narmada River. One of the primary beneficiaries will be the textile-manufacturing city of Ahmedabad in Gujarat, where the water table fell by over 20 meters in the 1980s. Yet, the project has become one of the world's most notorious examples of a rob-Peter-to-pay-Paul system of resource management. Critics note that 70 percent of Gujarat's drought-affected areas will not receive water from this scheme. The centerpiece of the project—the now-halted Sardar Sarovar dam—has alone displaced some 100,000 tribal villagers, and if completed, its reservoir will submerge some 37,000 hectares of forests and farmland.

Even so, the worst could be yet to come. The International Food Policy Research Institute projects that India will step up its water demand by 50 percent over the next 20 years. Its water demand will grow from just over 600 billion cubic meters in 1995 to over 900 cubic meters by 2020—the highest absolute increase for any nation over that span. Most of this increase will go to industrial and domestic users, with each projected to quadruple its current demand. By that year, it is estimated that most regions in India will be "water-stressed," meaning that water shortages could become chronic and widespread, and that the quantity available to each person will have fallen to 1,700 cubic meters or less—down from 2,200 cubic meters today, already just a third of the global average. (By comparison, the per person availability is 9,200 cubic meters in the United States and 12,800 cubic meters in Indonesia.)

India has prided itself on its self-sufficiency in food production, a task that will be rendered increasingly difficult by projected water depletion. (Although the country is a net exporter of food, on



average one-third of its households do not get adequate nutrition.) Declining soil quality could make this task harder still. About half of India's farmland—some 80 million hectares—suffers from some form of degradation. At a conservative estimate, says a World Bank report, soil degradation reduces agricultural output by between 4 and 6 percent a year; other studies have placed this annual loss at as high as 26 percent.

Putting higher prices on water and electricity to cover the real costs of their production could slow the water decline. This would encourage water-intensive industries like steel, fertilizers and textiles to leapfrog to more efficient production practices, and could prompt municipalities to revive local systems of rainwater harvesting and storage. It would also spur farmers to reconsider crop choices (sugarcane, for instance, is very demanding of water, and uses half of Maharashtra's irrigation water, although it is grown on just 10 percent of its cropland). It would also encourage them to maintain and improve bunding systems (barriers built along contour lines that prevent water runoff and spread rainwater evenly across fields), and to shift to more efficient irrigation practices. Since three-fourths of India's 4,000 cubic meters of rainfall is concentrated in 3 monsoon months, irrigation during the dry months is vital. In the northeastern state of Meghalaya, drip irrigation systems are constructed by stringing together split bamboo sticks that carry spring water over hundreds of meters to betel and black pepper orchards. In mountainous Himachal Pradesh, vegetable farmers hope to double their planted area by stretching their water supply with drip systems during the dry winter months. Introduced by non-profit International Development Enterprises, each system costs \$100 per acre of land irrigated. And some villages in Maharashtra manage water resources collectively. This motivates individual farmers to use this limited resource frugally rather than assuming that if they don't take as much as they can, some competitor will.

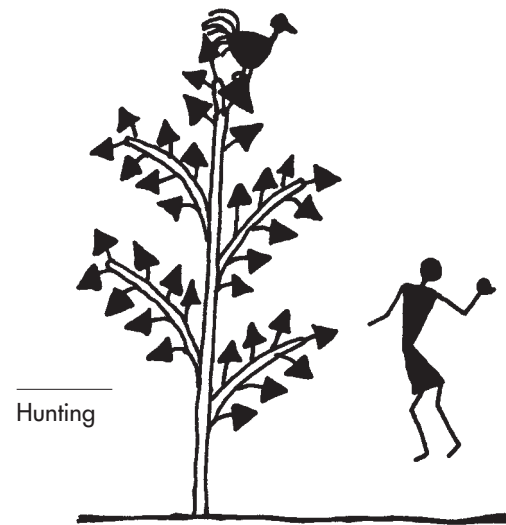
Disappearing Forests

India has one of the world's highest shares of arable land: more than half of its land is cultivated. (By comparison, 20 percent of land in the United States, and 10 percent of China's land—the world's other major food producers—is arable.) Unlike other populous countries such as Egypt, Ethiopia, or even China, it does not have vast areas of barren or mountainous territory from which little productivity can be gleaned. Another 20 percent of its land is forested, and 4 percent is pastureland. Although much of rural India lives alongside its farms and forests (3 million people live *inside* its forests), most of the country's people and industries are spread out over a remaining

area a little larger than the state of Texas. As India's population and economy swell, and its cities and industries expand into the countryside, it faces critical decisions about how to allocate its land. A key question is what will become of the four-fifths of India's land that is still not urbanized or industrialized.

Of the one-fifth of India's land that is forested, just 40 percent (or 8 percent of the country's land overall) is intact, dense forest. Plantations, which have displaced natural ecosystems with monocrops, cover almost a quarter of the land designated as "forested." (A third of these plantations cultivate eucalyptus, a fast-growing, non-indigenous species that is very demanding of soil moisture.) At 15 million hectares, India has the largest plantation area in the tropics. The natural forests that remain are fragmented and consist of more sparsely covered tracts.

Less than a century ago, 40 percent of India was forested. Large tracts of deciduous and tropical rainforest were destroyed over the past century as the



British expanded India's railway network across the country. Then, between 1951 and 1976, some 15 percent of the nation's land area was converted to cropland, and much of this came from natural forest. Today, though most of India's natural forests are protected by national law, 43 of its 521 protected areas are endangered by conversion to industrial uses. In the country's most forested state, Madhya Pradesh, in the very center of the subcontinent, diamond and sandstone mines have taken over parts of the Panna Tiger Reserve, one of the last homes of the tiger. The mines routinely dump contaminated tailings into the Ken River, which flows through the tigers' habitat. And one-third of the Melghat Tiger Reserve in Maharashtra has been "de-reserved" to make way for dam construction and industrial timber harvesting.

Forests are strained by increasing demand for their resources. As human and livestock populations swell

and forests shrink, the relationship between rural communities and forests has become increasingly precarious. Nearly 90 percent of the wood taken from the forests is used as fuel. And India's forests provide fodder for some 100 million head of cattle that trample and denude undergrowth as they graze.

According to the U.N. Food and Agriculture Organization, the area allotted to plantations in India has been increasing at an average of 15 percent a year. At that rate, if all the plantations were taken from existing forests, all of India's natural forests—even the sparsely covered tracts—would be destroyed in less than a quarter-century. Yet, India's natural forests provide it with some extremely vital services: they protect topsoil from wind and water erosion, regulate temperatures, replenish aquifers, store genetic diversity, offer recreational relief to an increasingly crowded human population, and provide a number of valuable products other than wood—including medicines and food.

Biologically, India's forests are exceptionally diverse: they range from the world's most extensive mangrove forests, the Sunderbans in West Bengal, to evergreen rainforest in the Andaman and Nicobar Islands, and dry alpine forest in the Himalayan foothills. Together, India's forests house some 45,000 plant species, 372 species of mammals, 1,250 bird species, and 399 species of reptiles. But this diversity is eroding precipitously, as natural habitat is cleared for new plantations or farms, bulldozed for mines or dams, or picked over for firewood. One in four of India's mammal species are threatened, says the International Union for the Conservation of Nature. India is one of ten countries with the highest percentage of threatened mammal, bird, and plant species. Endemic species—species that are found nowhere else in the world—are particularly vulnerable. Just 4,000 lion-tailed macaques, 2,000 Nilgiri *tahr*s (a kind of mountain goat), and 300 grizzled mountain squirrels now remain in India's Western Ghats, a southwestern mountain range designated one of the world's 19 "biodiversity hotspots" by Conservation International. Other distinctive fauna, such as the pink-headed duck, are already extinct.

In some areas, local communities have teamed up with state agencies to manage and regenerate forests. In West Bengal, 150,000 villagers tend to 350,000 hectares of *sal* forest (*sal* is a high-value hardwood somewhat similar to teak), some of which was badly degraded before the state Forest Department initiated the project in 1972. No money was exchanged for this service, but it has turned out to be an important economic transaction nonetheless: the revived forests supply the villagers with medicinal products, food and fuel, and officials no longer need to invest in policing the *sal* groves. Similar partnerships, involving some 15,000 villages in all, have been initiated in

other states. Since an estimated one-half of India's forest land is degraded to some degree, and the areas bordering forests are often unproductive marginal lands, such projects offer immense potential for regeneration of lost forest cover. Elsewhere, biogas plants (which convert organic waste like cow dung into a methane-based fuel) have offset firewood demand for some 10 million rural Indians—and have reduced the health risks of burning wood and dung cakes indoors.

Increasing Pollution

At current prices, about half of India's economic growth over the past half-century has been concentrated in the seven years since liberalization. Although the nation's notorious bureaucracy has daunted international investors, the prospect of finding hundreds of millions of new customers for their cars, colas, and cosmetics has proved irresistible. Nine of the world's major auto makers have set up shop in India in the last few years, as have Coca-Cola, Kellogg, Revlon and other international vendors of consumer wares. India has now opened up its natural resources to foreign investors, welcoming international oil giants Shell, Exxon and Mobil, and mining companies like Australia's BHP Minerals and South Africa's De Beers Group.

But the years since the new economic boom have also brought a spate of environmental problems—over and above resource depletion—of an enormity that India was unprepared for. Perhaps the most pervasive problem is that the building of productive capacity has run far faster than the building of any accompanying protections for environmental and public health. Where environmental laws do exist, they are largely unenforced: just 7 percent of Indian industries comply with pollution control guidelines, says the Asian Development Bank. The mounting risks that result from this course of action have been compounded by rising consumer demands, and population growth that is now the equivalent of adding the entire population of Australia to India's already





Moving—displaced by development

crowded land each year.

In the past ten years, the number of vehicles on Indian roads has increased threefold. With vehicles contributing over 70 percent of the country's urban air pollution, the consequences have been alarming: by one estimate, the average resident of Bombay or New Delhi has the lung capacity of a two-pack-a-day smoker. Most of the new automobiles are diesel powered (diesel is cheaper in India than anywhere else in the world), and only a fraction were equipped with pollution control devices when built. Diesel's sooty emissions aggravate asthma and other breathing disorders, and recent studies have linked diesel exhaust with increased cancer rates. Although new gasoline vehicles (1995 and later) are required to have catalytic converters, most are still tanked with fuel that contains lead, since the unleaded variety is hard to find at gas stations. Leaded gasoline damages the catalytic converters—and human nervous systems. According to the Tata Institute, air pollution in India caused an estimated 2.5 million premature deaths in 1997—equivalent to wiping out the entire population of Jamaica or Singapore. In 1995, 25 million people in India's major cities were treated for respiratory diseases like asthma and bronchitis.

Indian cities also churn out rising amounts of solid waste, much of which consists of substances that are hard to compost or return to the environment. In the last decade, for example, plastics consumption has increased ten-fold. Plastic bags litter the last remaining mangroves that line Bombay's western coast, while other inorganic waste clogs the creeks and lakes that supply the city's drinking water. India also generates 48 million tons of solid waste each year, most of which is disposed of in unsafe ways: burned, dumped into oceans and other water bodies, or land-filled. Chemicals leak out of landfills, contaminating agricultural land and groundwater supplies. In a country this densely inhabited, landfill space comes at the expense of valuable cropland or forests.

Another outfall of the widening gap between population growth and the building of suitable environmental protections is that only ten percent of all

sewage in India is treated. One result is that about one-fifth of all communicable disease in India is transmitted through contaminated water. And only a fraction of industrial wastewater is treated, although industries contribute half of the pollutant load.

India clearly cannot afford the costs of its continued inaction: a study by the World Bank pegs the health costs from air and water contamination at \$7 billion a year. By one estimate, Indian industries will need to spend \$3 billion on pollution control equipment by the year 2000. This demand will grow by 25 percent a year as industries expand and generate more waste. And fewer than one in three Indians have access to basic sanitation services. As Indian cities explode in the next few decades, municipalities will be hard pressed to meet these needs without private-sector assistance.

India can channel its influxes of foreign investment in ways that benefit, rather than impose on, its environment and people. In some areas it already has. For instance, with the help of Danish, German and Dutch know-how, India has become the world's fourth largest producer of wind power—forerunner to a decentralized renewable energy system that can help the country begin to phase out its heavily polluting, climate-threatening, and health-damaging dependency on coal. Because coal is abundant and its production heavily subsidized, 70 percent of India's power has come from this fossil fuel. The new market-based economy can help streamline environmentally harmful inefficiencies in the state-controlled model. For example, in the first five years of liberalization, India cut back its coal subsidies from \$3.3 billion in 1990–91 to \$1.9 billion in 1995–96.

And Another Kind of Impoverishment

India's ecological self-destruction has drained its key resources and undermined the health of its citizens. But the hardest hit, even though statistics may not always show it, are probably those who live closest to their ecological roots: an estimated 400 to 500 million rural Indians who depend directly on their

natural environment for their sustenance. Eco-historians Madhav Gadgil and Ramachandra Guha of the Indian Institute for Science describe these subsistence farmers, herders, fisherfolk, artisans and indigenous communities as "ecosystem people." India's natural resource commons have provided their food, traditional medicines, housing material and fuel. In terms of their sheer numbers—and the vital role they can play in preventing the erosion of India's natural systems—India's ecosystem people may hold an important key to its sustainable future.

Since industrial India has appropriated a large part of the nation's natural resource commons to generate its power, build its skyscrapers and discard its waste, four-fifths of the nation's villages are now not just income-poor, but natural resource-poor. In Kumaun, the hilly region to the west of Nepal, forests and pastureland have been cooperatively managed by local ecosystem communities for centuries. Soapstone and magnesite (magnesium carbonate) quarries have since taken over these commons. By depriving the local people of large tracts of their forest- and pasture-based livelihoods, the mines have cast them into profound impoverishment.

As the commons diminish and populations increase, a destructive treadmill is set in motion, and the resource-poor are forced to use their limited resources in increasingly unsustainable ways. And some of the most resource-abundant states house the largest numbers of India's poor—coal-rich Bihar, or *sal*-forested Meghalaya, for example, where extractive industries have displaced thousands of resource-dependent communities. Ironically, much of this destruction has been rewarded by the state, as investments in "backward" regions come with enormous tax benefits; of the top ten "zero-tax" payers in India, three are mining companies. As local people are pushed onto unproductive soils and arid hillsides which cannot support their needs, they have to seek out new sources of fuelwood, food, and fodder (live-stock feed).

Grassroots movements have long protested the impoverishment of India's ecosystem people. Those movements have included, for example, the widely publicized protests against the Narmada and Tehri dams, and the Chipko opposition to deforestation in the Himalayas. Several of these grassroots groups recently banded together to form a National Alliance

of Peoples' Movements. And there are signs that the authorities are listening. The southwestern states of Maharashtra, Goa, Karnataka, and Kerala banned mechanized trawling in their coastal fisheries during the monsoon months when fish breed, after local fishing communities complained that trawling was rapidly depleting fish populations. This has proved to be a sound resource management practice: harvests in Kerala have significantly rebounded since the seasonal ban was introduced in the late 1980s. And the government has seen clear demonstrations, in joint forestry projects like the ones in West Bengal, that traditional knowledge can be an invaluable factor in protecting natural resources and supporting local communities. But these efforts are still largely piecemeal, and the link between natural resource protection and peoples' well-being has thus far been given short shrift by policymakers.

And despite the social spending policies set in motion by Nehru and kept up by his successors, income poverty, not to mention resource-poverty, is still pervasive. Poverty rates have declined slowly in the years since independence—from 45 to 36 percent of the population. In absolute numbers of people trapped in poverty, India is still the world's poorest nation—more than 500 million Indians earn less than \$1 a day (many of them less than five or ten cents a day) in purchasing-power terms, says the U.N. Development Programme (UNDP). Meanwhile, the number of "super rich" Indians—those who earn over half a million dollars a year in purchasing power terms—quadrupled from 10,000 to 39,000 in the past 3 years. In short, the benefits of the country's impressive gains in GDP have not been well distributed. In India, the absence of comprehensive land reforms, and persistent inequalities like the legacy of the caste system, have perpetuated these injustices; some government policies have intensified them. Writes WRI's Robert Repetto about the nation's water subsidization policies: "In India, the rights to an immensely valuable resource were distributed gratis in a pattern even more unequal than land distribution, reinforcing rural inequalities in income and wealth."

India needs the benefits—health care, sanitation, education, clean water, and energy—that come with economic prosperity. Yet it also needs to address the inequities that undermine this progress. The *New York Times* quotes a bricklayer who earns less than \$1

Herding



a day, responding to the promise of India's economic expansion: "I was poor before, and I am poor now. I suppose I will always be poor." And the gap between the urban affluent and rural poor threatens to widen. A study by the New Delhi-based National Council of Applied Economic Research forecasts that in the next decade, the share of India's poor living in its villages will rise from 75 percent to 95 percent.

Mahbub Ul Haq, formerly Pakistan's Finance Minister, and advisor to the World Bank and UNDP notes that "experience in many countries has taught us that economic growth does not translate into human development: a link between growth and human lives must be created through conscious national policies."

Policies in the state of Kerala demonstrate the role that good governance—comprehensive land reform, and targeted spending on education, health care, and access to family planning, in this case—can play in overcoming human deprivation and unequal distribution. Almost all its citizens are literate, there is no population growth, it has the highest ratio of working women in all of India, and people live as long as their counterparts in industrial countries—on a seventieth of the income. And Kerala's achievements are relatively recent: from being India's second poorest state in 1960, by 1990 it was ranked among the five most prosperous, according to World Bank researchers Martin Ravallion and Gaurav Datt. Kerala's success provides a powerful model for improving human development and curbing population growth in other regions in India.

What's Next?

India's natural resource wealth—its coal, iron ore, arable land, forests, and freshwater supplies—can be viewed myopically as the fuel that drives its economy. It provides the commodity exports that bring in foreign exchange, and the cheap raw materials needed to build a domestic industrial sector fast. From a longer viewpoint, however, the rapid depletion of these resources is clearly unsustainable. By all indications,

India's natural systems are already showing signs of collapse—as seen in falling water tables, deforestation, degraded soils, and dangerous pollution levels. At a conservative estimate, says a World Bank study, the latter three forms of damage alone cost India 4.5 percent of its GDP each year.

India's massive expansion, both human and economic, will place tremendous demands on this already stressed natural resource base. In the next 50 years, its population is projected to increase by 700

million—equivalent to adding the entire population of Africa to its already huge numbers. Almost all of this increase will be in cities,

projected to triple in size from today's 250 million to 750 million by 2050, when almost half of India's population will be urban. In the same period, says the Tata Institute, at an estimated 5 percent economic growth a year, industrial production will increase at staggering rates: steel production will grow 10-fold, cement 15-fold, and cotton textiles 8-fold. Without radical changes in the way natural resources are managed, the collective impact

of this expansion on air and water pollution, water scarcity, habitat destruction, human health, and rural livelihoods—and the national economy—could be devastating.

If India's grassroots communities and urban victims of pollution—to whom the impacts of this resource destruction are painfully apparent—could frame the national agenda, competing in the international arms race would probably not feature on their list of priorities. They might tell a different story: that the future of this giant nation depends on its ability to protect its natural support systems. India can harness its unique combination of biological and intellectual diversity in this effort, rather than shrink and marginalize it. Its success in this task will have profound implications for the world as a whole.

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