# COMMENT

Women in Odisha, India, where in 2014 the Dongria Kondh forest tribe won a lawsuit to stop a bauxite mine from opening.

# The global south is rich in sustainability lessons

Educators must share how communities in the developing world manage environmental change — a Western bias limits progress, argues **Harini Nagendra**.

In a Bangalore slum, Dhanalakshmi tends six plant pots balanced on a wall. They contain shoots of holy basil (or tulasi, *Ocimum tenuiflorum*). I asked her why she does this, in a cramped space with an unreliable water supply. She told me that the plants replace her tiny roadside kitchen garden, which she lost when the street was widened. The wind blew the basil seeds into the pots. "How can one turn away a guest, even if they come uninvited?" she said.

Dhanalakshmi's deep, personal connection to nature shapes her actions, even though she lives far from the countryside. Such attachments are shared by many people around the world. They run through centuries of Indian thinking on sustainability: nature offers material benefits; it is part of people's cultural identities and often viewed as sacred. Protecting nature also confers social merit. A stone inscription from AD 1340 describes the motivation of Chenneya Nayaka, the ruler of a region near Bangalore, for building an irrigation tank: 'to support animals, cattle, birds, and all other living beings, and the service at all times of (the goddess of water) Ganga Devi'[1].

In the early twentieth century, Mahatma Gandhi fought poverty and injustice through peaceful civil resistance. He championed local production, education, health care and self-sufficiency. Inspired by Gandhi's ideas, members of the Chipko and Appiko environmental movements hugged trees in the 1970s and 1980s to prevent them ▶

▶ from being felled[2]. In 2014, after 12 years of campaigning, the Dongria Kondh forest tribe in India's Odisha state won a lawsuit to stop a bauxite mine from opening and ruining the hillsides that they revered and depended on for food.

These strongly rooted local movements have brought sustainability issues into everyday conversations in India. They have inspired generations of activists. Yet most university courses on sustainability omit them. Teachings still have a Western focus, even in India. Most books on sustainability frame the discourse in terms of Earth's finite resources and rising population.

The limited Western view of sustainability is stifling progress, just as the world faces crises over water, climate change, energy and biodiversity. That view also does a disservice to the variety and creativity of thinking and actions on sustainability in societies across the globe. Developing countries face the most acute challenges in this regard, yet they have the widest gaps in knowledge. Solutions that work in one place might fail in another. Excessive consumption, inequity and social injustice are not questioned enough.

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At Azim Premji University in Bangalore, my colleagues and I see sustainability differently. We have moved away from framing it exclusively around limits to growth and conserving natural resources. Instead, we emphasize the connections between communities, ecosystems and social justice. In an online course, for instance, we discuss the '3 Fs' — finitude (or limits), fragility and fairness (see go.nature.com/2t3rfdd). As well as university students, from undergraduate to postgraduate level, we teach bureaucrats, educators, corporate executives and practitioners through online courses and in-class curricula.

Sustainability education must be more globally inclusive. Only then can the discipline deliver the transformative change the world needs, rather than tinkering with business-as-usual.

## LOCAL DIFFERENCES

Sustainability is usually discussed as if 'one size fits all'. Calls to action target the individual: plant a tree, ride a bike, compost your food scraps (see go.nature.com/2rwsupi). Or they focus on markets and corporations: invest in renewable energy and green buildings. On these terms, local contexts are irrelevant and materials matter more than people — buying an electric car is 'green', even if the cobalt for its battery might have come from a small-scale artisanal mine with horrific labour conditions.

Most of the sustainability workshops I've attended in the past three years in India focused on reducing resource use. We discussed emissions cuts, recycling and the circular economy while sitting in air-conditioned rooms in luxury hotels, sipping bottled water. Poverty, environmental justice and governance were not mentioned.

Most 'classic' writings on sustainability present people as the problem, not as a collective source of strength. These include Garrett Hardin's 1968 essay *The Tragedy of the Commons*, Paul Ehrlich's 1968 book *The Population Bomb* (Sierra Club/Ballantine Books) and *The Limits to Growth*, a 1972 report by Donella Meadows and colleagues. For example, *The Population Bomb* opens by describing the streets of Delhi in 1966 as "alive with people" — eating, washing, sleeping, visiting, arguing, screaming, urinating, clinging to buses and herding animals. An obsessive focus on overpopulation has led to millions of forced sterilizations worldwide[3].

Much is left out from these accounts. Political economist Elinor Ostrom, in her influential work on the commons[4], demonstrated the powerful capacity of people when they are organized in collectives. Discussions of increasing consumption are largely absent from classic writings on sustainability, despite the cases for sufficiency made by twentieth-century Indian thinkers. German economist Ernst Friedrich Schumacher, whose book *Small Is Beautiful* (Blond & Briggs, 1973) championed local, sustainable technologies that empower people, was inspired by Gandhi and the Indian economist J. C. Kumarappa.

In our courses, we shine a light on these issues. And we show our students how iconic local movements in the global south have been just as influential in their regions as US environmentalists such as John Muir, Aldo Leopold and Rachel Carson were in theirs. In Latin America, for example, the concept of *buen vivir* (living well) has widespread resonance. It espouses harmony with

Protesters in Bhopal march against proposed dams on India's Narmada River.

administration ignored the knowledge of local communities. Officials failed to appreciate the fragile social and ecological interconnections in these densely inhabited, biodiverse landscapes.

Our students tell us that some of these findings come as a surprise. The fragility of communities must be considered alongside ecosystems. No technology, no matter how good, is a magic silver bullet. Narratives such as Dhanalakshmi's can contradict widely held assumptions — for instance, that strong ties to nature exist only in pre-industrialized societies.

Some students have reversed their opinions. For instance, those who initially supported diverting water from full rivers into others that ran dry now understand the importance of maintaining river-basin flows for ecosystems and communities. Practitioners have been sufficiently inspired by these examples of ecosystem management through fire and grazing to begin altering their approaches to working with communities.

## GRASS-ROOTS CAMPAIGNS

There are hundreds of environmental movements across Asia, Africa and Latin America. Although they are diverse, they have features in common. Such movements emphasize environmental justice and tend to emanate from local cultures. They are often led by women's collectives, and use non-violent means of protest. They question the industrial route to development and champion collective action. Social justice and the rights of nature are given the same prominence as limited resources. Multi-generational thinking often features.

For example, in 2008, catalysed by a coalition of indigenous groups, Ecuador became the first nation to incorporate rights of nature in its constitution[5]. Bolivia followed suit in 2009. These rights include protection, restoration and respect for existence.

Grass-roots campaigns can be powerful in questioning unsustainable paradigms and changing minds, even when they don't prevail. For 33 years, the Narmada Bachao Andolan mass social movement has marched and brought court cases to stall dam construction on India's Narmada River, which runs from Madhya Pradesh to the Arabian Sea. It did not stop the dams, but it has raised awareness of the consequences for people and places of big, top-down developmental projects.

Local groups tackle a wide range of issues. In Indian cities, groups such as Hasiru Dala work with poor rag pickers to collect and recycle waste. In Bangalore, residents are liaising with municipal authorities, cattle grazers and fishers to restore the

nature, prioritizing community well-being and respecting plurality of thought[5]. From Nepal to Mexico, indigenous communities have managed forests and prevented poaching in locally run reserves. Those fenced off by governments have fared much worse.

We dissect lots of case studies in our courses and workshops. One clear lesson is that transplanted solutions often backfire. For example, a ban on livestock grazing degraded the ecosystem of the Keoladeo National Park — a region of wetlands in Rajasthan that is rich in bird life. The Indian government introduced the policy, following US practices, to protect supposedly pristine landscapes from trampling. Cattle were duly ejected from Keoladeo in 1982. But the diversity of birds and other wildlife plummeted — the canals became clogged with weeds and grasses, which were previously eaten by the cattle[6].

Community relations are important. In 1974 in southern India, the indigenous Soliga tribe was banned by the government from setting controlled fires in the forests of the Biligiri Rangaswamy Temple Tiger Reserve. The community warned policy-makers of the consequences, but they did not listen. Without control through burning, the invasive shrub *Lantana camara* ran riot, choking vegetation and reducing fodder and food[7]. A well-meaning policy, influenced by ecological ideas about succession, has ended up damaging the forest as well as relationships between the tribe and the forest department.

Technologies, too, can bring more harm than good. In the push for solar energy, land has been acquired forcibly from poor farmers. In Nepal and India, replacing traditional mud-lined irrigation tanks and channels managed by farmers with centrally managed cement-lined canals has increased maintenance costs and damaged social capital. The canals silt up, and farmers no longer meet and work together to repair them.

In all these cases, a science-focused

Indigenous people protesting in Brasilia over the government's failure to safeguard their land.

Kaikondrahalli and Jakkur lakes. Across rural India, community groups collaborate to protect local forests, create sustainable jobs and provide incomes while protecting biodiversity. Agro-ecological initiatives such as the Deccan Development Society in Medak district, the Foundation for Ecological Security in Anand and the Timbaktu Collective in Anantapur district work with farmers to restore forests and common land, and to promote organic methods of farming and soil-friendly crops such as pulses and millets.

To encourage networking and dialogues, the Vikalp Sangam or Alternatives Confluence, a non-profit collaborative discussion forum and website, documents grass-roots experiences (www.vikalpsangam.org). Governments can help to scale up such initiatives. For instance, a programme of the state government of Kerala called Kudumbashree works with women's groups on empowerment, livelihoods and sustainability.

Governments and grass-roots initiatives cannot solve all sustainability issues in isolation, especially in a country such as India that is accelerating towards an industrialized and urban future. We just have to look outside our classroom windows to see the negative impacts of India's relentless growth.

But sustainability and conservation are dismal disciplines. The next generation needs cases of hope to counter narratives of gloom and doom. And they need to know that successes can be found on their doorstep, not just in the West.

### GLOBAL LESSONS

Sustainability curricula must be rethought. It is important to learn about, teach and communicate ways to reduce resource consumption. It is even more crucial — and

much harder — to transform world views and dismantle unsustainable paradigms of development and growth.

Sustainability needs to be defined as encompassing natural resource conservation as well as social justice and collective action. Such world views must go beyond purely utilitarian concepts of nature. Educators should tailor their lessons to be more globally inclusive. The United Nations Environment Programme, the UN Educational, Scientific and Cultural Organization and Future Earth, a global research hub for sustainability, should develop more diverse educational and outreach materials. Academics, indigenous and local communities, practitioners and environmental activists must all be involved.

To expand the range of cases examined, researchers must document contemporary grass-roots attempts to engage with sustainability in the global south, such as those discussed here. A good start is the Seeds of a Good Anthropocene project run by Future Earth. This shares case studies and tools to support positive visions of futures that are socially and ecologically desirable, just and sustainable. More examples should be drawn from Africa, Latin America and Asia. Researchers from the global south should lead study projects, and funding agencies should provide financial support at the scale needed to maintain such leadership.

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Key topics to explore include how communities reshape traditional approaches to grapple with twenty-first-century challenges, how they address gender and caste inequities, and how philosophies and faiths influence people's attitudes to nature. For example, Kudumbashree, the Foundation for Ecological Security and the Deccan Development Society are enabling women farmers, fishers and grazers to take the lead in public decision-making. The Dongria Kondh tribe's belief that each component of the landscape has sacred significance shaped its rejection of commercial mining[8].

Sustainability curricula cannot rest on just-so stories. A set of universal principles needs to be derived, while respecting local contexts. Ostrom's framework[4] for governing shared resources is a good basis. Local crafting of rules, limiting free riders through monitoring, and strong local leadership are used in such disparate cases as community forests in Nepal, Subak irrigation systems in Bali's rice fields, alpine grazing commons in Switzerland and Satoyama agricultural landscapes in Japan.

Science and technology can only go so far. Without understanding alternative imaginations — such as the cosmology of the Dongria Kondh or the compassion of Dhanalakshmi — we limit our power to effect change. ∎

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### CORRECTION

In the Comment 'Cybersecurity needs women' (*Nature* **555**, 577–580; 2018), the photo of female programmers was captioned incorrectly. They were at the US Army Ballistics Research Laboratory in 1962, not working on ENIAC at the University of Pennsylvania in the 1940s. Also, the figure of 57% cited for women in the US workforce was actually for women in the US professional workforce.

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