

Health

AN ECOSYSTEM APPROACH

7

A Cleaner City and Better Health in Kathmandu Community solidarity helps to solve environmental and health problems

An entrenched system of social organization, environmental degradation, and poverty have conspired to create a public health crisis in Kathmandu. Waterborne and helminthic diseases are rampant, as are respiratory and digestive illnesses. But the situation is improving dramatically for the city's poor, thanks to a unique collaboration between Nepalese and Canadian researchers and the work of a local nongovernmental organization.



Network for Ecosystem Sustainability and Health: David Waltner-Toews

The river marks the boundary between project and nonproject areas — actions to clean up the riverbank are clearly visible.

To many outsiders, Nepal remains a romantic land of rural villages and hamlets nestled in the pristine, mountainous corridor that separates India from China.

In reality, however, today's Nepal is highly urbanized, with much of the country's population concentrated in Kathmandu. A doubling of the population since the 1950s has created a panorama of startling contrasts: a modern, commercial metropolis standing alongside the city's medieval core; neighborhoods of squatters and poor labourers vying with those of wealthy residents.

Rapid growth has also had a profound impact on the physical environment of the Kathmandu valley. "The growth in population, housing, roads, and small-scale industries in Kathmandu over the past three decades has created very serious health hazards," says Dr D.D. Joshi, director of Nepal's National Zoonoses and Food Hygiene Research Centre (NZFHRC). "There is serious water pollution in all five rivers in the Kathmandu Valley and air pollution from gas vehicles and industrial sources. This has meant that people suffer from many airborne and waterborne diseases."

For several years, Dr Joshi has contributed to a collaborative project that seeks to deal with one crucial aspect of the ecological and public health malaise facing the city: the "zoonotic" diseases that spread — via food, water, and garbage — from animals to humans.

A healthy collaboration

With funding from Canada's International Development Research Centre (IDRC), the NZFHRC has joined forces with the Nepalese community agency Social Action for Grassroots Unity and Networking (SAGUN). While Dr Joshi's organization has been responsible for the biomedical research detailing the extent of infestation and designing strategies to counter it, SAGUN has mobilized support for on-the-ground action.

Together, they have initiated programs such as a mother and child nutrition project, training for health personnel, and upgrading the practices of butchers, restaurateurs, street-sweepers, and other key players in the battle against zoonotic diseases.

Meanwhile, several researchers from the University of Guelph — led by Dr David Waltner-Toews — have brought to the project an innovative set of tools (dubbed AMESH, or the Adaptive Methodology for Ecosystem Sustainability and Health) designed to mediate and, it is hoped, harmonize competing interests and divergent visions of environmental crisis in socially complex settings. With a society divided along religious lines (between Buddhists and Hindus) and further stratified according to ethnic origin and an occupation-based caste system, the social landscape in Kathmandu is about as complex as it gets.

The focus for the collaborators' work has been Kathmandu's Wards 19 and 20, two adjoining political districts directly abutting the Bishnumati River and a short walk from the city's centuries-old tourist district. Palaces and temples are at the centre of these old, mixed-income neighbourhoods, surrounded by houses of priests and people of pure caste, with a secondary ring of artisan caste houses. Finally, settlements for the "unclean" jat castes (subdivided into "touchables" and "untouchables") are consigned to the periphery. Dividing the population by caste is a highly elaborate exercise (among the Newar ethnic group, for instance, there are 36 different castes). Although discrimination on the basis of caste is outlawed, Nepalese society remains effectively divided along these traditional lines. The riverbank area on the outskirts of Wards 19 and 20, for instance, is populated exclusively by lower caste people.

"Occupations reserved for the so-called 'untouchable low caste' are butchering, garbage collection, street vending, cleaning, cremation, and begging," says SAGUN's Mukta S. Lama. "These are socially despised and stigmatized jobs. These traditional practices [of segregation according to occupation] have had a negative impact on these groups, which is reflected in high rates of morbidity and lower life expectancy."

It is along the polluted shoreline of the Bishnumati River that Kathmandu's interrelated crises of poverty and environmental degradation are most readily apparent. Until very recently, the slaughtering of water buffalos took place in the open air, with intestinal contents and waste meat routinely dumped into the water where people bathe and draw their drinking water. Many people defecated by the riverbank, stray dogs roamed freely, and vultures perched in the trees, waiting to feed from bits of carcasses. Garbage pick-up — which could mitigate water contamination, the threat of rabies, and the spread of disease — has been largely ineffective.

The human impact of these environmental problems has been profound. Waterborne diseases and helminthic diseases such as intestinal parasites are rampant in Kathmandu. In an NZFHRC survey in Wards 19 and 20, 40% of stool samples tested positive for parasites. Other NZFHRC statistics show that, out of a sample of 831 people, 14% tested positive for echinococcosis (a parasite that penetrates the intestinal wall and migrates through the



Network for Ecosystem Sustainability and Health: David Waltner-Toews

Nepali research linking the spread of disease from animals to humans has resulted in a new Animal Slaughtering and Meat Inspection Act.

bloodstream to organs such as the liver and lungs). Moreover, 26% of slaughtered water buffalos were found to have hydatid cysts.

Zoonotic diseases have been found to spread through the community not just through direct contact with meat and wastes produced by slaughtering operations, but also through the water system. Although the municipal drinking water is often deemed unsafe for consumption without boiling, most small restaurateurs have complained that it is too expensive to boil water before serving it. Furthermore, most patrons mistakenly believe that they can become immune to the effects of contaminated water by drinking it.

Such conditions — exacerbated by rising poverty — have contributed to what appears to be a public health crisis in Kathmandu. In a survey undertaken in Wards 19 and 20, Nirmala Budhram of the University of Guelph asked residents to report incidences of illness in the preceding 12 months. The emerging portrait was grim: 52% reported chronic bronchitis; 34%, asthma; and 29%, episodes of diarrhea and vomiting. Moreover, 84% of respondents reported high levels of symptoms associated with emotional distress.

Real ecological improvements

In the face of these challenges, however, there have been encouraging signs of progress. Dr Joshi — who has been studying Nepalese meat-marketing practices since 1989 and the presence of echinococcosis and hydatidosis in Kathmandu since 1991 — reports that the ongoing work to understand the conditions in Wards 19 and 20 has prompted Nepal's government to formulate and approve a new Animal Slaughtering and Meat Inspection Act.

Locally, advances have been concrete and dramatic. Now "there are organized slaughtering practices with better hygiene and sanitation," says Dr Joshi. As a result of public consultation and mobilization, animal slaughter now takes place in enclosed concrete areas. Butchers have begun to compost intestinal contents and other waste from animals: the resulting compost is being sold as fertilizer for market gardens. A new road along the Bishnumati River has facilitated a better-organized garbage collection and

disposal system. Public toilets have been constructed in Wards 19 and 20, with associated sanitary facilities. Perhaps most inspiring, adds Dr Joshi, in a spot in Ward 20 where once there was garbage, today "there is one beautiful green flower garden."

Dr Joshi believes that blending science and a recognition of the social dynamics in the communities was essential to achieving these goals. He speaks of "a very successful social relationship among different stakeholders" in Wards 19 and 20, and of "the good harmony and understanding" that enabled collaborating agencies to combine their efforts and expertise.

Indeed, the scale of environmental problems in Kathmandu — problems that involved people from many different walks of life — made it essential to enlist the support of a wide range of participants. The ward chairman and ward councilors put aside political differences to work on practical initiatives to improve life in the area. Meanwhile, much of the energy for the ground-level work came from local "clubs" — organizations of mostly young people that took on specific tasks like organizing recycling drives and garbage pick-up.

This strong social orientation of the work, however, developed over time after researchers had come to realize that science alone wasn't adequate to meet Kathmandu's ecological challenges. Dr Waltner-Toews recalls that, when he joined Dr Joshi and other colleagues in 1991, his interest was applying a conventional scientific analysis to the problem of hydatid disease, caused by a parasite in the intestines of dogs and which can be transmitted to people and livestock.

"We did basic epidemiologic studies, looking at people's behaviour patterns, whether they owned dogs, the percentage of animals that were sick," he recalls. "But when we got to the end of the first project [in the mid-1990s] our conclusion was 'those techniques are really good for describing problems, but it's much harder to come up with solutions.' You come in, you do all kinds of measurements, and you try to convince people to make changes. But that doesn't acknowledge the interactions between social, cultural, environmental factors, and public health. People have to be able to see those connections for themselves and then decide where their priorities are."



Network for Ecosystem Sustainability and Health: David Waltner-Toews

Dinesh Khadgi, head of the Butchers' Association, is helping to change slaughtering practices and improve his community.

Embracing social factors

So when a second phase of the project was launched in 1996, it had at its core the idea that citizens had to be engaged in finding solutions. SAGUN took on the task of educating residents about health issues and what they could do to improve health standards. The organization concentrated on the poor who, in Kathmandu, survive on less than a dollar a day and generally live in unsafe, congested, windowless houses.

"SAGUN begins with meetings with people to analyze the social and environmental situation," says Mukta S. Lama. "Such meetings are organized in groups of 20 to 30 families. The role of SAGUN facilitators is generally to ask appropriate questions so the group can analyze its situation on its own. We believe that involving people in reflecting on their own situation is the most effective way of raising awareness and internally understanding the need," he explains. "Through these discussions, community members articulate action plans to address the problems. SAGUN helps them implement such plans and advocates community issues at broader levels."

Meanwhile, the complexities of caste divisions had to be factored into the process. This is where Dr Waltner-Toews' AMESH methodology came in. Developed toward the end of the project as the multilayered nature of Kathmandu society became more apparent, the system was designed as a means of breaking down adversarial relationships by allowing participants to see their actions as interrelated parts of a larger system.

The AMESH approach attempts to do that primarily by creating complex diagrams depicting the roles of groups within a social ecosystem. Arrows, boxes, and colour-coded text are used to show where and how the interests and viewpoints of different sectors of the community collide, intersect, or overlap.

One example of where AMESH was applied was in analyzing why the ward garbage pick-up systems were not working. For the merchants in the area, the problem was that the street-sweepers — women of a low caste, whose work often exposed them and their children to the threat of disease — did not work hard enough and did not work on weekends. For the street-sweepers, the problem was that merchants — whom the sweepers sometimes accused of being abusive — would hear their garbage cart bells and throw their trash out onto the street only after the trucks had passed.

The value of these diagrams, says Dr Waltner-Toews, is that participants can get some distance on their own role in a particular situation. They see their perspective as only one component of a larger social system that has a practical impact on everybody's lives.

Dr Waltner-Toews believes that outsiders are well suited to the role of creating these diagrams, since they come into the situation with fresh eyes. They can use their detachment to help participants "get a better understanding of what is going on, and also to help them create processes that will transform the situation."

"Our role here," he explains, "was to stand back, listen, and then give feedback. It was like looking in the mirror. We'd go away and create these diagrams and then say to the research group and the community 'This is what we hear you saying. Do you recognize yourself in this?'"

Networked learning

Although the Nepal Urban Ecosystem Health Project has ended, its effects continue to be felt, both in Kathmandu and much further afield.

Dr Waltner-Toews reports that AMESH methodology is being applied to different situations in different countries. A new entity called the Network for Ecosystem Sustainability and Health has also been created so that communities using participatory, multidisciplinary approaches to ecological problems can share knowledge among themselves, without having to consult with academic researchers and research programs.

Back in Kathmandu, SAGUN continues to work on improving the nutritional and health status of people in Wards 19 and 20, with the support of the Swiss nongovernmental organization Terre des hommes. This work has been extended to four other wards in the city. NZFHRC is also moving forward with a rabies-control program, involving the vaccination of dogs, and continues its work strengthening the capacity of the ward clinics to diagnose and treat food- and waterborne diseases.



Network for Ecosystem Sustainability and Health: David Waltner-Toews

Enclosed slaughter yards and clean drinking water have reduced the sources of disease in Kathmandu.

Dr Waltner-Toews believes the work would not have got this far were it not for the optimism and strength of the residents of Kathmandu. "It is a very remarkable place," he says. "And it is filled with very remarkable and resilient people."

This *Case Study* was written by Stephen Dale on behalf of IDRC's Communications Division.

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Ecosystem Approaches to Human Health

Human health and well-being are intimately tied to the health of the ecosystems that sustain life. Yet the potential for improving health by better managing the local environment is an avenue rarely explored in mainstream health programming. Through its Ecosystem Approaches to Human Health (Ecohealth) Program Initiative, IDRC aims to identify the web of economic, social, and environmental factors that influence human health. Communities can then use this knowledge to better manage ecosystems and improve the health of both people and the ecosystem.

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