



Ecohealth Works

Agricultural Transformations

Irrigation, chemicals, and crop technology are transforming agriculture around the world. Farmers from developing countries are challenged by these changes, affecting livelihoods, food security, environment, and health. Using ecohealth approaches, researchers can better understand the complex dynamics affecting health in agro-ecosystems and design more equitable and sustainable solutions.

THE CHALLENGE

Advances in technology and global trade are changing agriculture around the world. Faced with immediate needs to feed their families and make a living, many farmers in developing countries are opting for short-term solutions that are degrading ecosystems in the long term. About 11% of the Earth's land is suitable for agriculture, but excessive use of pesticides and fertilizers, contamination by heavy metals, and soil depletion have already taken about 2% of agricultural land out of production — about 10 million hectares.

At the same time, globalization is influencing the demand for agricultural products, bringing about dramatic changes in ecosystems and affecting the health of farmers and their families. Rice, for example, is increasingly replacing

traditional cereal crops in the tropics, but rice paddies require more water than traditional crops and are ideal breeding grounds for malaria-carrying mosquitoes. To address these kinds of issues, ecohealth approaches marry the improvement of agricultural practices and human health with the ongoing viability of agro-ecosystems.

WHAT'S HAPPENING?

The International Development Research Centre (IDRC) supports ecohealth research and networks to develop sustainable responses to the impact of agricultural transformations on human health. Ecohealth projects generate sound scientific knowledge and build capacity of local researchers and communities while seeking to influence policies to mitigate the negative impacts of agricultural transformations



A Malawian project participant holds her harvested groundnuts.

C. Hiebert

in communities of developing countries.

GENERATING KNOWLEDGE

IDRC-supported researchers have successfully applied ecohealth approaches

across the developing world to produce knowledge on health and agricultural changes such as water management for agriculture, pesticide use, and food security and diversity.

Understanding the impact of small dams in Morocco

The Souss Massa area of central Morocco is known for its vegetables and fruits, principally grown for export. Persistent low rainfall in mountainous areas has affected human health and economic development by reducing crop yields as well as forcing women and young children to travel longer distances to fetch water. As water sources dry up, people and livestock are pressured to use the same water sources, increasing the risk of contamination. In response to recurring drought, the state built 21 small dams to conserve water.

IDRC-supported researchers examined the impact of the Asgherkiss dam on human health and the surrounding ecosystem, making a range of discoveries. For instance, the dam provides more water for personal hygiene in nearby communities, but also increases the presence of mosquitoes — a carrier for diseases such as malaria — and attracts wildlife, with attendant disease hazards, like avian influenza. The team also found that women living downstream spent less time fetching water and more time working in irrigated fields and processing Argan oil, generating additional income for families.

“Our challenge is to now use research findings combined with local knowledge to benefit the affected communities, and in the long-term, to support better water management throughout Morocco to cope with climatic change and improve community resilience, health status, and well-being,” says Dr Ait Lhaj Abderrahmane, who led the research team.

Floriculture in Ecuador

In Cayambe and Pedro Moncayo, in northern Ecuador, the cut flower agro-industry is reshaping the social, economic, and environmental landscape. Located primarily in low-lying fertile valleys, some 150 farms have attracted many migrant labourers; the population of the two counties has doubled in 20 years. While wages are slightly above average, the region still experiences profound social inequities. As the industry turns increasingly toward exports, new high-tech farms using vast amounts of pesticide have raised health and environmental concerns among community leaders and scientists.

An ecohealth research team explored the socio-economic, environmental, and health dynamics of this agro-ecosystem, and confirmed that chemicals from floriculture were contaminating the water and affecting people nearby. Beyond pollution, water availability for agriculture and human consumption is a critical issue for many Andean communities. The project found that one hectare of floriculture in Cayambe consumed more water than one urban hectare in Quito, Ecuador’s capital. Health problems were also observed by the researchers.

“Workers are suffering from abnormally high rates of persistent headaches and dizziness,” says team leader Dr Jaime Breilh. Health problems were also observed by the researchers. “We also documented through neurobehavioural testing that children’s development is affected by environmental contamination.”

Soil, food, and healthy communities

Children’s health was also a key component of ecohealth research into agricultural transformations in Malawi. In the Ekwendeni region, researchers from various specialties involved over 4,000 resource-poor farmers and their families as part of a study on how to improve food security, soil fertility, and child nutrition. Farmers received seeds for planting as well as information about agricultural issues, gender relations, and nutrition. There were recipe days, community shows, and other events to foster local knowledge, discussion, and adoption of nitrogen-fixing legume crop varieties (like groundnut).

Between 2003 and 2005, farmers more than doubled the average area of their fields growing groundnut and pigeon pea, and there was a significant increase in the number of farmers burying legume residue to improve soil fertility. Some farmers even reported a modest increase in income from the sale of these crops.

But the transformations were not limited to farming. Researchers found that healthier child feeding practices, particularly breastfeeding exclusively for the first 4 to 6 months, was associated with better child growth. Part of the study's success is attributed to how it empowered farmers through knowledge and taking action.

BUILDING CAPACITY

IDRC strives to build capacity of local researchers and organizations to generate meaningful results and promote excellence in research. Ecohealth projects also seek to empower communities to take charge of their own environment and health through the research activities.

Strengthening capacities of farmers in Malawi

As part of an ecohealth approach on soil, food and healthy communities in Malawi, Farmer Research Teams (FRTs) underwent formal and informal training for conducting research in the broader community. A volunteer, farmer-led organization, a FRT is made up of different social groups, including people often left out of social processes, like widows and divorced women. Among its activities, the FRT organized annual farmer exchanges, enabling hundreds of farmers to exchange knowledge about agriculture and nutrition. With FRT leadership, farmers play an increasingly important role in all areas — from multiplying and distributing seed to promoting nutrition to research and planning. As a result, farmers' voices are increasingly heard in decisions by local government.

Harnessing the skills of women in Yemen and Lebanon

In both Yemen and Lebanon, especially in rural areas, traditional knowledge and agrobiodiversity are gradually being lost. In two studies, researchers examined whether indigenous foods could help contribute to improving

health in poor and marginalized communities and at the same time, contribute to safeguarding ecosystem integrity.

In Yemen, women shared knowledge on local crop varieties, food preparation techniques, and traditional recipes. Ultimately, the recipes were published and distributed throughout the region, expanding people's food alternatives and diet diversity.

In Lebanon, researchers set up "healthy kitchens" in four communities, promoting the use of wild edible plants and training women in several areas such as hygiene and the cooking of traditional recipes. As a result of a catering business that grew out of one of the communities' kitchen projects, 25 women became involved in economic decision-making for the first time.

The key to success in both Yemen and Lebanon was the empowerment of women.

Potatoes and pesticides in Ecuador

In Ecuador, small-scale farmers cultivating potatoes use highly hazardous pesticides. Together with farmers, non-governmental organizations, universities, and public health and municipal authorities, a team of researchers developed a package of interventions to reduce health hazards from pesticide use. The project familiarized communities with the effects of pesticides on ecosystems and human health. It promoted better crop-management practices to reduce pesticide exposure. The interventions included training sessions for farmers, funds for protective equipment, health education sessions for the local population, and radio programs.

More than 2,000 families benefited from these interventions, around 250 community primary health workers were trained in the safe use of pesticides, and 100 health providers were trained to diagnose and treat acute pesticide intoxication. To ensure sustainability of the project, a store was opened offering advice and alternative products for pest management (such as insect traps and low toxicity pesticides). The work also had a significant impact on policy, described below.

Through a participatory exercise, farmers discuss crop management alternatives to pesticide use.



J. Arevalo

INFLUENCING POLICY

Policy influence is a means of transforming new knowledge into enduring change. This can be achieved through the continued engagement of policymakers throughout the research process. Ecohealth approaches promote this engagement.

Engaging decision-makers on pesticides in Ecuador

Researchers worked hard to engage municipal decision-makers on the need for alternative approaches to extensive use of pesticides. To that end, the project held a forum with the national association of Ecuadorian municipalities in 2007. It convened more than 100 government officials to discuss integrating a health agenda into local regulations for agricultural development. One key recommendation from the assembled mayors was a call for the central government to review and reform existing laws regulating the sale and use of highly hazardous pesticides.

And in Morocco

The small dams project was able to provide the evidence to convince the responsible watershed agency to allocate financial resources to implement the recommendations of the project for better water management and health outcomes. It also supported the regional council's vision to revive the idea of small dams as an effective drought adaptation strategy and ensured that any new dams built would be planned, built, and managed with community participation.

Community members and the research team from Morocco explore environmental perceptions during a workshop.

FUTURE ECOHEALTH WORK ON HEALTH AND AGRICULTURAL CHANGES

As global agricultural production grows exponentially to meet the increasing demands for food, it is crucial that research and development efforts pursue the support of sustainable production systems that promote health while reducing poverty. These issues will be centre stage in global efforts to mitigate greenhouse gas emissions and adapt to climate change. Ecohealth approaches provide researchers much-needed frameworks and tools to address seemingly conflicting needs within ecosystems.

Ecohealth — short for “Ecosystem Approaches to Human Health” — is a research framework that addresses how human health and environmental quality are determined by complex relationships among different components of an ecosystem. It is used to explore how human health can be protected and improved through more sustainable ecosystem management. Researchers work across academic disciplines to develop sustainable solutions that transcend the health sector. Ecohealth approaches help translate research findings into policy and action. For more information about the Ecohealth Program at IDRC, visit www.idrc.ca/ecohealth.

For nearly 40 years, IDRC has worked in close collaboration with researchers from the developing world in their search for the means to build healthier, more equitable, and more prosperous societies.

International Development Research Centre
Ecosystem Approaches to Human Health Program
PO Box 8500
Ottawa, ON, Canada K1G 3H9
Email : ecohealth@idrc.ca



A. Abderrahmane

