

Interact

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Reversing the land degradation trend in sub-Saharan Africa

Bernard Yerima reports on a recent collaboration in Cameroon which highlights the importance of innovation and outreach in countering environmental degradation.

The degradation of land resources on the African continent has resulted from many human factors – unsustainable agricultural practices, cultivation on marginal or fragile lands, loss of agricultural lands to housing estates, overgrazing, deforestation and damage to watersheds, inappropriate land rights and tenure systems, and the near absence of appropriate regulatory and enforcement policy instruments. All have led to diminished water flow rates for hydro-power generation and increased sediment deposition in water catchment tanks, leading to increased water treatment costs. The construction of housing estates in wetland areas has also led to diminished water resources and the pollution of underground waters, resulting in outbreaks of disease epidemics.

To reverse this trend, many sustainable land management and forest regeneration efforts are being introduced by international organisations. A lack of appropriate knowledge on soil-water-plant interactions, however, constrains these efforts. Further, the land base on which the local farmers depend is finite and diminishing, and resolution of land tenureship systems on the continent remains a challenge and a source of litigation.

The university setting is the most likely environment for the development of the necessary know-how to resolve these prob-

lems. Potential users of new technologies often require concrete proof that an innovation is feasible in order to justify their investment. Presently, the structures that would provide a framework for the development and dissemination of such technologies are limited. This is an opportunity for universities to make a positive impact through capacity building and by serving as a catalyst for the university-farmer-policymaker synergy that is necessary for a proper understanding and resolution of environmental problems.

In a collaboration between the Yongka Western Highlands Research Park (YRP) in the northwest region of Cameroon and the University of Dschang, a holistic approach to addressing the above issues was initiated in 2000. The collaboration aimed to put in place sustainable plant husbandry technologies that would improve carbon sequestration, reduce climate change impacts, and enhance biodiversity and watershed management through adaptive agro-forestry research and outreach.

Student study tours, internships, and research activities are regularly carried out here and act as pathways for the dissemination of innovative technologies. Since 2007, more than 600 students from Bamenda University and the University of Dschang, as well as farmer groups, have visited the research park for these activities.

Farmers' needs have been identified through these visits, and include wood for fuel and timber, wood for art works, furnishings and carvings, fruit trees, spices, and medicinal plants. There is also a crucial need for appropriate trees to be planted in watershed catchments to increase water yields.

Equally, the emerging climate change scenarios, driven by increased deforestation and forest degradation, demand reforestation with appropriate tree species.

The collaboration has been conducting research to address these needs, involving in-situ and ex-situ plant collections and modelling of plant growth rates. For these technologies to be adopted by farmers, the production cycle of the plants needs to be shortened and trees with fast growth rates selected. The selection of appropriate tree species using vegetative propagation techniques is also necessary.

The results obtained so far are very promising. Together with the universities and local farmer groups, the research park constitutes an environment for the shaping and dissemination of innovative technologies on watershed management, biodiversity conservation, climate change impact, and agroforestry-related aspects. ■

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Service-learning in statistics: a success story

Service-learning combines formal teaching with a related service in the community. Here, **Catharine Dishke Hondzel** and **Bethany White** look at a recent project involving students of statistics.

Even with the omnipresence of statistics in today's society, undergraduate students often find it difficult to recognise the relevance of statistics to their areas of interest and future careers, and their comprehension of the statistical problem-solving process tends to be weak. Statistical education literature promotes educational approaches that complement active and constructivist learning principles. Based on Jean Piaget's constructivist learning theory, students actively construct their own knowledge based on their individual experiences and ideas.

This means that many students will not learn statistics effectively simply by having material presented to them. They should be offered opportunities that encourage active involvement in their own learning. In addition, many students enter statistics programmes with strong mathematical skills, but with weaker 'soft skills' related to knowledge dissemination and translation to the public. To help augment our students' statistics training in these areas, service-learning was introduced into a course for students majoring in statistics and actuarial science.

Our service-learning course was designed to provide students with an opportunity to experience the statistical problem-solving process in action, to apply specific statistical analysis techniques, as well as to prepare students better to present results of statistical analysis to a non-technical audience. Only third and fourth-year undergraduate students were eligible to take this optional course in order to ensure that students had the necessary foundational knowledge of statistics.

The university partnership offered considerable cost-savings over using a private consulting group.

With support from the university's teaching support centre, a call to agencies was sent out through local charity and non-profit networks asking for proposals from groups that required assistance with the analysis of survey or client data. A local employment agency responded to the call and asked for assistance with an environmental scan of potential and current client groups.

The agency hoped to use the data to inform outreach initiatives, to develop new services, projects and programmes, and to help them determine decision-making priorities. A memorandum of understanding was signed by both parties which provided terms of reference – as well as guidelines – for the scope and deliverables of the project.

The service-learning component was woven into the course and its assessments – including assignments, class discussions, and a final project which was completed in groups and involved presentations and written reports to the agency.

The class consisted of five groups of three students. In order to consolidate the relationship with the agency, students were introduced to the agency's project manager within the first few weeks of the class. At this time, he presented an overview of the organisation, a summary of the mission and vision, and the various problems the agency had identified. Students then had the opportunity to ask questions and gather information about the nature and scope of the project.

The response from the employment agency was quite positive. Results of a general satisfaction questionnaire, as well as exit survey data, confirmed that the agency found the information the students provided to be helpful in the decision-making process and allowed further insight into the nature of the client population. Significantly, agency leadership felt that the university partnership offered considerable cost-savings over using a private consulting group or limited staff resources to analyse the same data. In addition, the organisation found the objectivity of the students to be of benefit, as they brought 'fresh eyes' to the issues. One of the students was even

hired by the agency for the summer to extend the work accomplished by the class.

Success notwithstanding, the project did encounter several challenges. Since the project was new and untested, there was a need to include both the university's legal counsel and the research ethics board in early consultations to review the nature, scope, and liability of the commitment. In addition, locating a suitable agency with a usable project required the cooperation of local non-profit aggregators, volunteer networks, and community newspapers. Though service-learning and other community-university partnerships which encourage experiential and applied learning opportunities are becoming more common, they do require more resources and support than traditional instructor-led programmes. Ultimately, these projects can offer students valuable learning opportunities while providing net community benefit, and should be encouraged. ■

References

- Bovee, S.L. and O'Brien, M., 'The development of an integrated experiential model for student transformation', *Christian Business Academy Review*, 2.1 (2007).
- Duke, J.I., 'Service Learning: Taking Mathematics into the Real World', *Mathematics Teacher*, 92 (1999) 794-6.
- Garfield, J., 'How Students Learn Statistics', *International Statistical Review*, 63.1 (1995).
- Kolb, D.A., *Experiential learning: Experience as a source of learning and development*, (Englewood Cliff, NJ: Prentice-Hall, 1984).
- Von Glasersfeld, E., 'Learning as a Constructive Activity', in *Problems of Representation in the Teaching and Learning of Mathematics*, ed. by C. Janvier (Hillsdale, NJ: Lawrence Erlbaum Associates, 1987).

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Co-creation of knowledge on occupational health

Jutta Gutberlet reports on a university-community partnership which explores health and safety in recycling cooperatives in Brazil.

The informal collection and classification of recyclable materials from household and commercial waste is a common activity in most parts of the world. In countries such as Brazil, some of the recyclers are organised in cooperatives or associations and may perform the activity of selective waste collection with the support of local governments or NGOs. Inclusive waste management generates income, redistributes wealth, and improves environmental health.

Despite the organised structure, however, the working conditions of these recyclers remain precarious and health hazardous. Most recyclers don't wear safety gear (gloves, goggles, mouth masks) to protect themselves during their work. Governments are usually understaffed and often don't allocate the resources necessary to improve the occupational health of these workers.

As part of the Participatory Sustainable Waste Management project – a university community partnership between the University of São Paulo and the University of Victoria,

The participatory nature of the research meant involving the participants early on in the research process. This has allowed for the creation and mobilisation of knowledge on health and safety in recycling cooperatives.

developed in the metropolitan area of São Paulo, Brazil – an action-oriented research project on occupational health was conducted in 2011, involving professors, students, and members from six recycling cooperatives in the region.

In order to learn about the specific occupational health issues and the strategies needed to address safer working conditions, a participatory methodology was applied to create this specific knowledge collectively. The research was organised in three phases: mobilisation, workshops, and feedback sessions. During mobilisation, the researchers presented the idea and objectives of the action-oriented study at the six recycling groups and invited cooperative members to choose two representatives to participate in the workshops and to act as knowledge transmitters between the research group and the cooperative.

At the beginning of the workshops, 'ice-breaking' activities were conducted to support an open and trusting learning environment. The workshops involved brainstorming and active learning, applying collective mapping, acting, and drawing methods focusing on possible risks and health hazards, as well as respective strategies to overcome these during the work phases of collecting, separating, and manipulating recyclable materials.

The workshops were conducted at the premises of Fundacentro, a national research centre on occupational health and safety. On average, eight recyclers, three students, three university professors, the coordinator of the Reference Centre on Occupational Health in São Paulo, and a professional from Fundacentro participated in the research. The recyclers were compensated for transportation costs, food, and work time. After having completed the workshops, the systematised data was presented at the six cooperatives involved in the research. The feedback session provided insights to the main occupational health issues and discussed some of the proposed solutions.

The interactive research process allowed the discovery of a number of serious occupational risks. These included risks related to chemical hazards (e.g. from handling cement bags and containers with toxic products); biological hazards (e.g. from packaging contaminated by bacteria or fungus); infections, due to cuts from glass, paper, metal or other sharp objects; musculoskeletal damage due to carrying heavy loads or performing the separation under inadequate ergonomic and organisational conditions; mechanical trauma from accidents in the street or at the workplace; and poor emotional wellbeing due to stress, lack of illumination, and poor air circulation.

In some cooperatives, frustration and dissatisfaction were the result of a lack of ▶



Recycling workers in Diadema, Brazil

Calendar

Sociocultural Dynamics Influencing Progress in Lifelong Learning Systems: From National to Regional Perspectives

28 September 2012

Sofia, Bulgaria

<http://pascalobservatory.org/pascalnow/events>

National Outreach Scholarship Conference

30 September – 3 October 2012

Tuscaloosa, USA

<http://nosc2012.ua.edu>

10th PASCAL Conference: The role of HE in local and regional social and economic development

29-31 October 2012

Brest, France

www.univ-brest.fr/conferencepascal2012

ENGAGE 2012: National Coordinating Centre for Public Engagement, Annual Conference

5-6 December 2012

Bristol, UK

www.publicengagement.ac.uk

Let's Build Transformative Knowledge for Social Change: Big Tent Gathering at International Barcelona Conference on Higher Education

13-15 May 2013

Barcelona, Spain

www.guninetwork.org

Continued from overleaf

transparency or participation in the cooperatives' decision-making. Some participants raised stressful work relations amongst cooperative members as a key health issue and we learned that these were often related to leaders who were emulating hegemonic and oppressive social structures, including unequal gender relations.

Furthermore, the presence of rats, pigeons and insects were mentioned as serious problems in many of the cooperatives. Local health authorities are aware of this particular problem and regularly spray to reduce the infestations. However, the root causes of badly organised work conditions within the cooperatives and poor material separation at the household level are not yet tackled sufficiently.

During the workshops, acute issues related to social exclusion and homelessness surfaced, escalated by problems created by alcohol and drug abuse among recyclers, which are usually not professionally treated. The study further revealed the impact on emotional health caused by stigmatisation and prejudice against people working with selective waste collection. The recyclers expressed the need to

generate more awareness about their work, and to become recognised and remunerated as environmental stewards.

The participatory nature of the research meant involving the participants early on in the research process. This has allowed for the creation and mobilisation of knowledge on health and safety in recycling cooperatives. It has permitted us to collect valuable first-hand information on the work-related health hazards of recyclers which, when systematised, will contribute towards wider academic and empirical knowledge. Furthermore, the knowledge-creating process in itself has stimulated awareness-building amongst participants, be it recyclers, students or researchers. As Margarete, one of the recyclers from the cooperative 'Raio de Luz' in São Bernardo do Campo, puts it: 'I have become very proud of my profession. I am a recycler (catadora) and I am pleased to know that there are people concerned with the health of recyclers.'

The research has co-created important knowledge on the occupational health situation involving organised informal recyclers, as well as on environmental education direct-

ives. The multifarious health and safety issues related to the different work activities in the recycling cooperatives were clearly identified and solutions were suggested for some of these problems. Recyclers and researchers alike reiterated that, the Government (and particularly the local government) should recognise and address the vulnerable working conditions of recyclers – not through prohibition but by improving the recycling operations and reducing the risks in the cooperatives.

As a practical outcome of this collaborative and democratic knowledge creation, a folder was produced on the particular health and safety issues of recycling cooperatives. The folder was distributed to recycling cooperatives and local governments in the region and during events on related themes.

Ultimately, the collaborative research process highlights the complementary nature of academic knowledge to the local knowledge present among the recyclers. The co-generation of knowledge provides effective and feasible strategies and resolutions to tackle acute social and environmental problems under research. ■

The ACU's University Extension and Community Engagement Network brings together over 500 engagement practitioners at universities, research centres, and civil society organisations across the Commonwealth and beyond. For more information on what we do, please visit us at www.acu.ac.uk/extension or email extension@acu.ac.uk

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