



Viewpoint

Responding to Risks and Vulnerability Issues Through Interdisciplinary Curricular Teaching: A case example from the University of Zambia

Justin Lupele, D EQUIP2, Zambia and
Charles Namafe, University of Zambia, Zambia

Abstract

This paper emerges from a keynote presentation at the School of Education, Department of Teacher Education of the University of South Africa Research Indaba in September 2010. The paper introduces the concepts of risks and vulnerability by means of two examples of what happens when development ignores social and environmental impacts. Specifically, it introduces risks and vulnerability in the context of the construction of the Kariba Dam between Zambia and Zimbabwe, and informal settlements in South Africa. It examines what is meant by interdisciplinary approach to curriculum teaching in responding to risks and vulnerability issues. The discussion of interdisciplinary teaching draws on the experience of the University of Zambia which introduced an interdisciplinary taught environmental education undergraduate degree programme. The case of the University of Zambia provides insights into interdisciplinary curricular teaching in environmental and sustainability education. The paper further provides the basis for critical reflections and recommendations on interdisciplinary curricular teaching as a response to risks and vulnerability.

Introduction: Risks and Vulnerability

Risks and vulnerability have been discussed in environmental education in southern Africa by many scholars. Risk comes with probability of exposure to danger and in the context of our discussion, the probability of being exposed to environmental threats. It also examines the capacity of people and communities to cope with threats. Most of the threats are caused by natural phenomena such as floods, droughts, fire, storms, landslides and volcanic eruptions. Risks lie in the probability of exposure to any of these threats. For example, global climate change is likely to amplify existing environmental concerns and risks in southern Africa. According to the UNEP African Environmental Outlook Report (2006), Africa is extremely vulnerable to climatic variability and change, which is likely to worsen the impacts of drought, flooding, desertification and sea-level rise. Southern Africa has been identified as one of the most vulnerable and at-risk regions with regards to the projected impacts of climate change (UNEP, 2006). The links between drought, crop production and malnutrition are probably of most concern, as they highlight the connection between climate, disease, food security and other stresses. The emerging picture from this discussion seems to suggest that human risks and vulnerability are always caused by natural phenomena, yet there are those which are caused by our desire to exploit nature for our benefit. This is often done in the name of development. To illustrate this point I draw on the construction of the Kariba Dam between Zambia and

Zimbabwe. This is an ideal case study that demonstrates what happens when development ignores human and environmental impacts.

Construction of the Kariba Dam

In order to pave way for the construction of the Kariba Dam in 1958, the local Tonga and few Korekore tribes who lived in the Zambezi Valley were relocated to other places. This process was accompanied by armed resistance and violence. A number of local people were killed (Clements, 1959). For millennia the Tonga people had lived on the Zambezi River banks. They had developed a better understanding of their environment. They were great hunters and grew two crops in a year. One was rain fed while the other was planted in the deep alluvial soil deposited on banks as the river's annual floods receded. They were organised as a family rather than on a tribal basis. They had also developed systems for ensuring food security, as Clements (1959:83) notes: 'A characteristic of their kraals was that their storage huts were built on silts. These were the most important structures in the village, and the grain was kept on a high platform to protect it from white ants.'

Their living in harmony with nature was disrupted when they were forcefully relocated to new and strange places, away from the alluvial soils that had given them food. In these new environments cattle had no grazing lands. They had to learn new ways of survival. These who were settled in the Lisutu area on the Zambian side soon discovered that the soils were susceptible to erosion. Nothing could grow easily and thus they were exposed to vulnerabilities such as disease, hunger, cultural erosion, habitat and perennial drought. To date, the Tonga of Lusitu and Gwembe Valley live in abject poverty. Their traditional coping strategies to vulnerability were eliminated from their way of life due to the forced relocation. They have never benefited from the development that hydroelectricity promised would provide. The electricity pylons from the Kariba Hydropower Station now pass over their huts to provide power to the cities of Zambia and some neighbouring countries.

The story of the Tonga people is a good starting point for discussing issues of risk and vulnerability that are human induced. There are many other stories that one can draw on in the Southern African Development Community (SADC) region and elsewhere to discuss risks and vulnerability issues. A recent report in the *Mail & Guardian* (2010) revealed the shock experienced by South African President Jacob Zuma when he came face to face with the risks and vulnerability experienced by an average person in an informal settlement. The president was visiting the Orange Farm informal settlement in Johannesburg when he was almost reduced to tears due to the poor living conditions of the shanty compound dwellers. The paper reports, in part:

President Jacob Zuma was nearly reduced to tears when he saw a family's living conditions in a shack he visited in Orange Farm, Johannesburg, he said on Tuesday.

"It is not almost every time I feel like crying during my visits...You could swear no-one lived in that shack," Zuma told premiers, ministers and MECs at the President's Co-ordinating Council in Pretoria.

The family living there had been totally destroyed, he said, explaining that the owner's daughter left home to become a prostitute, and had returned when she fell pregnant.

South Africa has a housing backlog of more than 2.1 million and more than 2 700 informal settlements. A number of people have been subjected to all sorts of risks and vulnerabilities due to forced removals, unplanned settlements, poor water and sanitation conditions. This has been caused by poor or unfair development policies and governance issues such as those installed under the apartheid government.

Often the poor are more vulnerable and do not have coping strategies. There is a large and widening vulnerability gap between the poor and the rich. The rich have better all-round coping capacity. The poor and disadvantaged have fewer or no options to cope with vulnerability. The two examples of how people are exposed to risks and vulnerability require new capacities for adaptation and resilience in southern African. There is need for a paradigm shift in approaches to livelihoods in general. Environment and sustainability education has an important role to play in supporting people and institutions in southern Africa to prepare for, prevent and adapt to the impacts of risks and vulnerability.

An Interdisciplinary Approach to Teaching

The goal to educate current and future generations about risks and vulnerability needs to place emphasis on connections, coherence, civic consciousness and cross-curricular competencies for solving the problems confronting humanity. Most single disciplines would not easily prepare the learners to tackle the many risks and vulnerabilities that we face. Thus, the need for an interdisciplinary approach to the teaching of complex social ecological systems. Innes (2005), in the case of forest training, argues that for several hundred years training in forestry has emphasised the need for a forester to have knowledge of all aspects of forestry. He observes that foresters have been expected to be the ultimate generalists, having sufficient knowledge of each area of their field to enable them to make effective decisions that cover a range of different disciplines. Innes' argument stresses the need for an interdisciplinary approach to teaching if risks and vulnerability in our society are to be reduced.

To discuss the topic 'Responding to risks and vulnerability issues through interdisciplinary curricular teaching: reflecting on environment and sustainability education' we draw on the experience of the University of Zambia (UNZA) who are running an interdisciplinary undergraduate degree programme – the Bachelor of Education (Environmental Education). The case study has been developed from in-depth discussion with the programme initiator and coordinator. It has also been strengthened by discussions with the students as well as interrogating their course work in form of assignments.

Development of the BEd (EE) at UNZA

The Bachelors of Education in Environmental Education (BEd EE) at the UNZA started in 2008, partly to respond to a myriad of environmental risks and vulnerabilities resulting

from deforestation, land and water degradation, unsustainable use of human and natural resources as well as loss of biodiversity and cultural diversity. An interdisciplinary programme in environmental education was seen as the chief educational response to environmental issues and risks that the country faces. This belief was further strengthened by global and local policy pronouncements for the need for holistic approaches to the teaching of environmental education or education for sustainability. Global events that shaped the introduction of the BEd (EE) at UNZA included the 1977 Tbilisi conference. The conference recommended, for example, that environmental education is the result of the reorientation and dovetailing of different disciplines and educational experiences which facilitate an integrated perception of the problems of the environment, enabling more rational actions capable of meeting social needs to be taken. The other global influences came from the 1992 United Nations Conference on Environment and Development (UNCED, 1992) and the World Summit on Sustainable Development held in Johannesburg in August 2002. Local influences include the National Policy on Education known as 'Educating Our Future' (Ministry of Education, 1996) which places emphasis on the production of a learner who is capable of 'participating in the preservation of the ecosystem in one's immediate and distant environments' (Ministry of Education, 1996:5). The National Environmental Action Plan also sounded the need for holistic teaching of environmental education.

In 2000, the University of Zambia introduced a MEd (EE) degree. According to the course coordinator, the experiences of running the postgraduate degree showed that a first degree in environmental education was a must to provide the requisite competences to candidates. Hence the introduction of the BEd (EE) programme also served to fill the existing gap within the university. It is envisioned that the graduates from this programme will service environmental aspects of doing business in the corporate world and industry. The coordinator argues that all institutions of the 21st century and beyond without exception are required to have environmental education officers and, that currently in Zambia many such officers lack a first degree qualification in the field.

The process of eliciting support

Worldwide, universities tend to offer three main types of programmes, namely: majors, major/minor and interdisciplinary (or multidisciplinary) programmes. The most common offerings are majors as well as major/minors and, since its establishment in 1966, UNZA has predominantly been offering major and major/minor degrees. Interdisciplinary degree programmes have historically been rare and quite complex to deliver. Currently the university has only three fully fledged interdisciplinary programmes, namely: the degree in Gender Studies, BEd (Environmental Education) and a degree in Civic Education.

The School of Education and the Department of Language and Social Sciences Education (LSSE), in particular, spearheaded the development of BEd (EE) at UNZA. The process started with identifying concepts, methods and approaches of various academic disciplines across the university faculties. The resulting programme outline was a bigger and more holistic picture than would be generated by single subject offerings. The draft programme outline formed a framework for the programme. It also became the basis for eliciting support from other

academic disciplines. The coordinator recalls that the process was not easy and faced a lot of challenges. He and his Dean moved from school to school within the institution explaining the benefit of the programme. While the Deans agreed to the idea of the new programme in principle, the idea was rejected in two departments belonging to the School of Natural Sciences. The departments of Biology and Geography rejected the programme. The latter went further to suggest that the programme should be scrapped all together. They argued that their department was already teaching the content of environmental issues and that they were the only ones with expertise to teach environmental issues. Suggestions were made that the School of Education should concentrate on the provision of teaching methods to their students and leave the environmental content to specialised schools.

In order to make progress, the School of Education removed Geography and Biology courses from the draft programme outline. Extensive diplomacy and negotiation skills were required in this process. For example, the coordinator ran a number of meetings with various colleagues to convince them about the benefit of the programme. He also drew on the long friendship and trust that he had built with colleagues in other schools. These had worked with him, respected and trusted his intellectualism. He prepared a paper to orient colleagues to the BEd (EE) Programme. His was a plea of support as exemplified by the following statement during the meeting;

‘The School of Education and the Department of LSSE at UNZA are merely custodians of the programme charged with the responsibility of coordinating it on behalf of us all as Zambians and other people. We trust that you will be counted on to help move the programme to even higher and loftier heights than is the case at the moment.’

With a great deal of persuasion and support from colleagues, the course was approved at departmental, school and senate levels. Since the course has been running it has drawn a lot of interest, even from the schools that rejected it. Some lecturers from the two departments who rejected the course have since expressed interest in participating in the programme. It has become so popular that the Department of Biology is developing a similar programme.

Characteristics of the programme

The interdisciplinary programme at UNZA has the following characteristics:

- It draws upon more than 50 different academic disciplines to create a coherent whole.
- It is driven by the pursuance of development, in general, and sustainable development, in particular.
- It is educationally focused in the sense that the majority of courses are drawn from the field of education, curriculum studies, adult education as well as education for sustainable development.
- It is rigid to some extent in that it offers compulsory courses and flexible in that it provides course alternatives or electives.
- It is holistic in opening up students’ minds to diverse ideas, methods and approaches from various subjects. The aim is to generate a rounded student who will be versatile in support of sustainability.

- It deals with cases of vulnerability, specifically as relates to rural environments and women affairs for which affirmative action is required.
- It is rigorous in intent, especially through courses emanating from philosophy, such as environmental ethics.
- It deals with both ecological and economic issues.
- It addresses issues to do with skills (techniques), knowledge and understanding as well as competences and values/attitudes.
- It provides a thorough period of student project work, partly through the long community/school experience period or short duration study visits to environmental sites.
- It critically revives central pieces of Zambian cultural heritage and, hence, a deliberate focus on indigenous African religions.
- It puts issues of sustainability at the core of student work.

Example of Interdisciplinary work done by students

In order to train the students in the field of sustainability, assignments reflect real-life risks and vulnerability issues. This is with the hope that the students will be equipped with knowledge and skills to tackle the myriad environmental risks and vulnerability issues faced by society. As a response to the risks of road traffic accidents, one of the major causes of deaths in Zambia, students were assigned to write an essay describing and analysing the type of values which were being displayed in the public through written inscriptions found on selected public and private vehicles. Their research data on this assignment was revealing in terms of causative factors of road traffic accidents in Zambia. Table 1 shows a summarised outline of the research finding as extracted from the students essay scripts.

Table 1. Vehicle inscriptions in Zambia and their underlying values

Inscription	Values (meanings) as interpreted by the vehicle owners
Life is not a race, it's a journey	Life is a journey to be taken one step at a time and not to be rushed through as speed kills.
Terminator II	The terminator in the movie is associated as being swift in everything he does. Like many other industries, the transport industry is very competitive and to make anything out of it, one ought to be fast in order to penetrate where others are failing.
This job is challenging	This gives the reason why bus drivers misbehave sometimes when driving because the job is seen as not being easy.
If you cruise you will crash	Value people's lives by not speeding.
Suffer now and enjoy later	People are always motivated to achieve targets despite challenges faced along the way.
Baba buses	Signifies the status of the minibus owner and the position of the proprietor in his own society. Using his minibus as an instrument of servitude, the minibus owner portrays his subjection as a public servant serving the people in his humblest manner.

They are not dug in a hurry	There are so many things desired in human life. However, a person cannot have all of these things at once, nor can s/he own them overnight.
Voyagers	People in transit – the business of moving people to their destination does not need any interference from anything/anyone.
Moving from glory to glory	Individuals are moving from one level of success to a greater one.
Trust the driver and obey the conductor	Passengers should be aware that a mini-bus driver is qualified to take people to their desired destinations, regardless of the speed.

Interpretation based on the assignment

- Risks: Many innocent Zambian passengers and pedestrians increasingly and unknowingly face daily risks from underlying values on the road held by mini-bus drivers.
- Vulnerability: Many Zambians are increasingly vulnerable to risks of over speeding.
- BEd (EE) students: Are being trained in techniques of sustainability, values and making connections between them in relation to real issues affecting Zambians (i.e. sustainable values, unsustainable values, etc.), but are facing challenges of finding attachment and employment.

Issues and Challenges of Interdisciplinary Teaching

1. As explained earlier, two departments refused to have their courses as part of the programme, yet the two disciplines provide opportunities to learn about environmental risks and vulnerability due to the nature of programme they offer (deep ecology).
2. Currently, the university is under-staffed and there is need for more lecturers for the various disciplines. For example, the university has no expert in environmental journalism and the programme coordinator is not sure how this course will be taught in the fourth year. This is also the case for the environmental law course.
3. Some lecturers in other departments are overwhelmed by the number of students they have to teach since the BEd (EE) students joined their classes, making learner support a significant challenge. It would seem that the stakeholders were not fully aware of the implications of bringing the new students on board.
4. The programme lacks learning and teaching materials in environmental education that are context specific and relevant.
5. Some students are uncertain about job prospects after completing the programme. The most affected are students who moved into the programme directly from secondary school. But those with a teaching qualification at diploma and certificate level are less pessimistic about this because they know they have a foundational teaching career available to them.

Conclusion and Recommendations

Environmental and sustainability education needs more than one discipline if it has to respond to the myriad environmental risks and vulnerability issues. These issues are often complex and a single-discipline approach can not provide all the answers. The richness and diversity provided by multi-dimensional perspectives will help found solutions to environmental issues and risks.

Lessons from the UNZA BEd programme indicate that perhaps it will be a good idea to start at a small scale with two or three disciplines coming together. For example, even when departments refused to take part the programme was implemented, stressing the fact that the number of disciplines involved is not as significant as the interdisciplinary focus.

Different faculties learn and benefit from each other; for example, the science and engineering faculties benefited from the education and vice-versa. Through interdisciplinary teaching, sharing of knowledge between different disciplines is possible but the process must be scaffolded by a coordinating department. It is also important to discuss well in advance the importance of introducing interdisciplinary cooperation in undergraduate degrees; including the expected increase in volume of work for lecturers as a result of the increased number of students. The physical separation of workplaces further discourages interaction. In order to seriously foster interdisciplinary teaching, institutional hurdles such as bureaucratic and institutional obstacles must be evaluated and eliminated.

Interdisciplinary teaching will succeed if the parties involved respect and trust each other. In the case of UNZA, the BEd (EE) programme works well with people who were closer to the programme coordinator. There is need to eliminate prejudice among different disciplines. Instead stakeholders should be encouraged to develop new ideas and dimensions for colleagues who are in touch with experts in other disciplines. Interdisciplinary teaching works well where there is trust, teamwork, understanding, good communication skills and friendship.

Collaboration always fails when different disciplines fail to communicate properly due to differencing expectations of one another. Internalised prejudices about alien academic fields, as discussed in the case of the Biology and Geography departments at UNZA, provides a good example of sources of resentment where the two departments feel they are the only experts in the field of environment. The word 'environment' means different things in different disciplines and there is therefore a need for harmonisation of the different terms and concepts. Biologists and educationist will define environment differently and may disagree on how to teach it. Scientists often fear that their 'science' will be diluted by the educationists. These fears can be allayed when interdisciplinary teaching/research is supported with well-articulated materials. Often models and frameworks would help to make others understand what is expected of them and how the programme could be handled. It would also help identify the available expertise in various disciplines well in advance.

Note on the Contributors

Justin Lupele is the Chief of Party for the Academic for Educational Development (AED)'s Education Quality Improvement Programme (EQUIP2) in Zambia. He is President of the

Environmental Education Association of Southern Africa. Email: lupelejustin@yahoo.com.

Charles Namafe is Assistant Dean (Research) at the School of Education, University of Zambia. Email: cnamafe@edu.unza.zm.

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