A practical exploration on the feasibility of Integrative Multidisciplinary research from a broad ecohealth perspective in South Africa

Elize S van Eeden
Subject Group History
North-West University
South Africa
Elize.vanEeden@nwu.ac.za

Abstract

This discussion is a deliberation on the progress towards the possibility of carrying out feasible research according to an Integrative Multidisciplinary (IMD) research methodology (theoretically and practically). To explore the IMD research methodology, a group of researchers from several disciplines started discussions from early February 2011 to plan a pilot research process in the Bekkersdal Township of the municipal region of Westonaria (Gauteng, South Africa). It was decided that the focus of research would be on searching for a broad definition of ecohealth to accommodate several disciplines and to attempt to produce a “package” of research results from many disciplinary angles. These results will eventually be discussed and refined through interdisciplinary (ID) and transdisciplinary (TD) research phases to “contain” consolidated reflections of the status of the well-being of the Bekkersdal community. However, the primary research question remains: whether it is possible to do research using IMD methodology, and whether this proposed methodology is more promising and constructive as an aid to understanding and disseminating research from various disciplinary angles than other methodologies. Although the pilot study of Bekkersdal has not yet been completed, progress so far has been very satisfactory and should bring about revitalised methodological insights in the near future.

Keywords: Integrative Multidisciplinary research; ecohealth; Bekkersdal township; Westonaria; Gauteng; South Africa, environment; humanities; social sciences.

1. INTRODUCTION

Interdisciplinary (ID) and transdisciplinary (TD) research cooperations in South Africa within the humanities and social sciences over the past decades can be traced through intervals of time up to 2011. However, ID cooperation is more common in the natural, medical and agricultural sciences. Educational changes in the country since the mid-1990s supported a debate on the status and value of integrated forms of research by disciplines in the humanities and the social sciences. South Africa’s Higher Education White Paper of 1997 also endorses an integrative disciplinary approach to research as suggested in IMD research:

The accountability processes that flow from the changing nature of the research enterprise are much wider than those associated with traditional research in the higher education system. The outcomes of research are not only measured by traditional tools such as peer reviews, but also by a broader range of indicators such as national development needs, industrial innovation and community development.

Because regional (and local) history (the discipline I am familiar with) covers a variety of themes in which human involvement and human interaction, specifically with and in the environment, is stressed, my research interest necessarily expanded to multidisciplinary level. Therefore the discussion to follow is a deliberation on the progress that has been made towards the possibility of doing feasible research according to an Integrative Multidisciplinary (IMD) research methodology (theoretically and practically). To explore the IMD research methodology a group of researchers from several disciplines started discussions in early February 2011 to plan a pilot research process in the Bekkersdal Township of the municipal region of Westonaria (Gauteng, South Africa). The focus of research that was decided on was the exploration of a broad definition of ecohealth to accommodate several disciplines interested and at random. The general thinking in the first discussion was to mainly attempt to produce a “package” of research results from many disciplinary angles that’s ecohealth related. As our discussions matured the call for a “multi-effort” research developed towards the disseminating of results that should eventually be discussed and refined through clear defineable interdisciplinary (ID) and transdisciplinary (TD) research phases that include consolidated reflections on the status of the well-being of the Bekkersdal community. However, the primary research question remains: whether it is possible to do research using the newly formulated IMD methodology, and whether this proposed methodology is more promising and constructive as an aid to understanding and disseminating research from various disciplinary angles than other methodologies.

2. UNDERSTANDING THE CONCEPT “INTEGRATIVE MULTIDISCIPLINARY ” (IMD) RESEARCH IN A “BROAD ECOHEALTH” RESEARCH THEME

Past and recent ideas and debates for integrative research in literature are dynamic which require a separate discussion. This dialogue is an additional angle to be considered as part of the ongoing deliberations on multidisciplinary research cooperations.

Integrative multidisciplinary (IMD) research

By integrative multidisciplinary (IMD) research, the conceptual understanding is that it is research that transcends the boundary of being only disciplinary, or of relying only on traditional ways of dealing with multidisciplinary, interdisciplinary and/or transdisciplinary research opportunities.
The ideal with IMD research is to structure a research project in which several disciplines participate in formalised phases that progresses from the disciplinary to the interdisciplinary, and then the transdisciplinary phase. The core activities in each of the phases (See diagram 1) include some basic features of an actually more defined understanding of the specific research phase in the context in which it is used. In IMD research the academic roots, epistemological backgrounds and research tools of each research participant is embraced and acknowledged from the D-phase, to the ID and the TD phase (See diagram 1).

After a group of disciplines in a research project have identified their core focus and locus (including the core research questions), research can commence by making use of an IMD approach. The IMD approach can be visualised as follows (see Diagram 1):15

What it means to broaden the ecohealth concept

Conducting research into ecohealth-related matters, and reporting on this kind of research according to ID and TD research methodologies, are relatively new in South Africa and thus not yet well explored. Therefore these methodologies appear to be totally absent in IMD research, especially in the humanities and social sciences.

According to the South African Department of Health’s Environmental Health Impact Assessment (EHIA) Guideline of 2010, environmental health can be defined as comprising:9

...those aspects of human health, including quality of life, that are determined by physical, biological, social and psychosocial factors in the environment. It is also related to the theory and practice of assessing, correcting, controlling, and preventing those factors in the environment that can potentially affect the health of present and future generations...

Though this definition appears all-inclusive, it has not yet been used in an integrative way in research efforts in South Africa. The importance therefore of considering an IMD research

DIAGRAM 1: A suggested research approach to Integrative Multidisciplinary (IMD) research for progressing from the Disciplinary (D) to the Interdisciplinary (ID) and the Transdisciplinary (TD) phases:

An IMD research assessment on the health12 status of a specific local area should thus depart from the scope of a broader health model as suggested by the Canadians. So far in existing research and assessment this suggested focus appears very limited. As recently as May 2011 Morgan reported that.13

The existing emphasis on environmental health and health protection looked increasingly inadequate to meet the needs of those looking for more complex analyses of health impacts in terms of social (and other) determinants.

Also recent international research reports refer to an IMD-like combination of research according to approaches dealing with human health and well-being as Sustainable Livelihoods (SL) or Ecosystem Health (ESH).14 So if a broader ecohealth research could be done inclusively by disciplines across the spectrum (in for example IMD research), then well-thought-through results, as a consequence of extensive deliberations, could and should lead to solutions or more appropriate local and regional environmental management that may provide constructive positive outcomes.

3. THE LOCAL ENVIRONMENT/AREA AND IMD RESEARCH IN ECOHEALTH

From the late 1970s to the early 1980s, local history research in South Africa developed alongside the ideas of the methodological approach of “History from below”,15 constructed by the History Workshop Group of the University of the Witwatersrand (Wits). In essence, the research approach by this Group was to emphasise a history from below, which meant that the role, input and knowledge of communities in certain environments and/or activities should be utilised and/or acknowledged in the scientific research process. In many ways this is partly what integrative research is all about if practiced within a broader IMD approach to research. (see discussion below on a pilot study in progress in the Bekkersdal area).
Views on contemporary ID and TD research methodologies could to a greater or lesser extent be associated with some of the historiographical trends of the Wits History Workshop. Historians, archaeologists, educators, political scientists, geographers and sociologists were key professionals associated with the academic activities of the Wits History Workshop Group.

As is the case with disciplinary and interdisciplinary research, the TD research methodology requires fundamental and structured research inputs to develop towards a representative and holistic, as well as useable, form of research reporting. In for example the contribution of health historian Virginia Berridge, she debated the impact of history in public discussion and policy making, with a specific emphasis on health policy. It was revealed that the research reports that health history historians have produced were used on government and other podiums without their actual presence or influence. In this regard it was found and suggested that:

- Policy makers have a need for clear narratives in many fields of communities (which historians do well according to the respondents Berridge has approached).
- Informal networks (such as in the case of social scientists who often deal with governing bodies) should be used; seminars (or forums) bring different networks together and therefore should be organised.
- By utilising a rational model in the development of formal mechanisms: History should begin to find its place in the health industry of systematic review, which is part of the rational model of research and policy making and the evidence-based movement.

Apart from the value of History when it comes to local environmental health research dissemination (the plea by Berridge), extensive debate and structured thinking about feasible research methodologies in integrative research contexts are still required in the early part of the 21st century. This applies to all disciplines locally and world-wide. The efforts of the organisers of the 2012 IREPS conference could certainly count as an initiative from which all interested in integrative research, could benefit.

4. ORGANISING A RESEARCH PROJECT FOR INTEGRATIVE MULTIDISCIPLINARY RESEARCH (IMD) ... OR DOES RESEARCH “NORMALLY” BECOME A NEED FROM THE BOTTOM UPWARDS?

Starting somewhere

Normally, in semi-parastatal research contexts, research needs are provided and any research done appears to be based on the needs of communities. In this regard, research done for local governments by the Council for Scientific and Industrial Research (CSIR) or higher educational research institutions are typical examples. The outcome of this research is either informative, the purpose of which is to develop national/internal policies to amend or develop acts, or it simply records some specifics in a particular environment or area. In this case researchers rely on existing models and theories to guide them in external research needs. In extraordinary circumstances researchers may pioneer new research ideas. This could happen, and is more likely to happen, in research environments where research needs are identified by the researchers themselves (for example in South Africa through the funding structures of the National Research Foundation (NRF).

To develop or explore new pathways for integrative research methodologies, the researchers involved should lead the research focus by observing, creating and revitalising current research thinking. The IMD research is intended to be a “revitalised” methodological framework (outlined in the previous sections). The aim was therefore that the identified IMD pilot project on the broader ecohealth status of informal and formal settlements in the Bekkersdal (Westonaria) municipal region of South Africa would be financially motivated by the need of researchers from various disciplines to explore a marginalised local area for the feasibility of IMD research.

Source:
http://www.routes.co.za/maps/gp/westonaria/westonaria.jpg

The outcome so far from the Bekkersdal pilot study, which was launched in February 2011, was that two research questions and two aims were developed to form the core focus for the team of disciplines involved. Baseline information about Bekkersdal was made available to all the research participants on an internal repository link of the North-West University’s website. From the core questions and aims, more explicit research objectives had to be developed from a disciplinary angle which should eventually be absorbed or transformed into the ID and TD phases (see Diagram 1). The core questions and aims for the IMD Bekkersdal pilot study as finally determined by June 2011 are the following:

Research questions:

i) Is it possible to do Integrative Multidisciplinary research on ecohealth issues from a multidisciplinary perspective (which would include the humanities and the social sciences)?

ii) What could be the broader ecohealth status of the Bekkersdal community in Westonaria, as researched on the structural basis of the IMD research methodology (namely progressing from the D to the ID and then the TD)?
With the intention that the research aims will compliment the research questions, all disciplines involved (9 fields which presents in total 23 disciplinary experts), has each developed a research objective from the two core research questions and aims. Research partners from a broad disciplinary spectrum in South Africa (but for the disciplinary and interdisciplinary phase mostly recruited from the North-West University) were invited to participate in the Bekkersdal pilot study. After a one-day workshop in early June 2011 with all near Bekkersdal, this group decided, among other things, to devote more time to deliberating on their role in the process of integrating research knowledge and to address the specific disciplinary-based research objective(s) they have decided on.

Currently most of the disciplines/groups involved view themselves as disciplines dealing with aspects of ecohealth in an indirect way which represents the broader understanding of ecohealth. It was therefore considered important to involve additional research participants from disciplines/groups in 2012 that will be able to add value to the Bekkersdal pilot study due to their direct involvement with ecohealth matters and from their respective angles of research. (see Diagram 2 the suggestions made of including disciplines/groups in the outer green circle in yellow). Disciplines in the health sciences and the natural sciences will be approached as the pilot study progresses and the need to do so is suggested by the Bekkersdal research participants in the interdisciplinary or transdisciplinary phases. It may be that absences or gaps in the TD research report information/data might require another round of disciplinary research input by some or all of the participants, and new disciplines or groups need to be involved (also see the research flow indications in Diagram 1):

**DIAGRAM 2: Disciplines involved in broad ecohealth research objectives according to the IMD model – Bekkersdal Pilot Study, 2011–2014**

Why Bekkersdal?
The locality of Bekkersdal (in the Westonaria municipal region of South Africa was specifically chosen as the pilot study focus to record IMD research so as to allow all the research participants to depart from the same entry level of research background while all being fairly unfamiliar or uninformed with this specific environment. This approach and the newness of modelling the IMD in an equally unexplored theme ecohealth provided the opportunity for experts in several disciplines to apply their skills and knowledge obtained from research in other regions/areas to make their first phase contribution to this specific area study (see Diagrams 1-2).

Therefore the research support and input of the IMD research participants in the pilot study of Bekkersdal will include, for example research objectives related to determining the community’s economic status, the environmental pollution status, and the possible health effects of the visible acid mine drainage in this and surrounding areas that may affect locals. Also foci such as how to improve the well-being of the community in a destructed environment and/or an economic environment that has enhanced the creation of a destructed, helpless and perhaps futureless community, form part and parcel of the broader research focus. In this regard it is foreseen that, after such a pilot research, more in-depth studies on aspects of the broader research focus will or could be selected to steer the IMD research to specific research needs as a result of the pilot study outcomes. On a larger scale of research (eventually the post-pilot phase), more qualitative and quantitative research on the broader environmental health status of communities could be done, and the IMD research methodology that was eventually developed to observe its feasibility in the Bekkersdal pilot study, could be further refined and applied in researching other areas.

**Bekkersdal’s history as backbone in identifying the disciplinary research objectives on broader health concerns**

In the previous section some of the micro research foci, transformed objectives, as part of the core research questions, were shared. To understand this selection the history of Bekkersdal serves as important background.

In the Bekkersdal area four mining houses serve the area (Goldfields Ltd as Kloof Goldmine, Harmony Gold, South Deep and First Uranium). This is the most important economic activity. The local community relies heavily on the goldmines to boost the local economy. However, declining production and retrenchments have recently negatively impacted on the well-being of the broader Westonaria community, especially the Bekkersdal inhabitants, of whom some former mineworkers are now jobless while living under environmentally polluted conditions for which the industry and the Bekkersdal people themselves should be accountable.

When the Western Areas Limited Gold Mine was active in this particular environment in the 1930s they managed, as part of their obligations to their employees, the administration of the area. With the Peri-Urban Health Board active at the time and health committees being founded all over the area, Western Areas Limited applied for a health committee to take over the control of the Westonaria management. For some unknown reason the Randfontein Town Council took exception to this, so
the application was delayed. After a petition and re-application, a health committee for the area was approved in 1942. Under the supervision of the initially small health commission, sewage works and black townships were established such as Bekkersdal. Very limited local service delivery concerns are recorded. Among others there is the bucket system in use for decades up to 1987, after which sewage works were built in Bekkersdal worth R18 million. A health clinic only operated from 1991 – many years after Bekkersdal became a town. Since 1991 malnutrition was seen as the most serious condition treated by the personnel of the health clinic. Recently air pollution concerns have been mentioned.

It is speculated that, with many temporary inhabitants from other countries in southern Africa working on the mines, the Bekkersdal area was only seen as a temporary area to maintain. So of the 820 formal houses initially built all were owned by the Westonaria Local Municipality. As reflected in the population statistics, the Bekkersdal community actually outnumbered the rest of the population of Westonaria. The dire need for housing caused informal settlements to expand in a disorderly way. Housing development was also affected by the geological composition of the area (it is dolomite area with the tendency to form sinkholes due to dewatering caused by mining activity). Population growth has put a heavy burden on the provision of water. For example, in the 1980s one tap for every 100–150 families was provided. Recent sources in the literature also speculate on the possible effects of acid mine drainage decanting on Bekkersdal in close-by areas. The inhabitants are also close to the Donaldson Dam (a source of the Wonderfonteinspruit which is a tributary to the Vaal River system), which is known for its high radioactivity levels in the sediment. People from the Bekkersdal community use this dam extensively for baptising their children and catching fish to eat which they should not actually do. They sell food close by, and allow animals to drink from the dam.

How will the research reporting and methodology look?
Apart from heavily relying on Diagram 1 (while being willing to refine the various research phases if required) to progress with an IMD research approach, a few decisions were made in the past twelve months:

- A group requires a project leader and a project advisor (a key research role player from each of the disciplines that participate).
- Most research participants (representing researchers from all the disciplines involved) will operate as field team members. Because the researchers will initially operate from a disciplinary viewpoint, no research methodology differences among disciplines will have to be discussed in Phase 1 of the research process. This may have to be discussed in Phases 2 and 3 (see Diagram One). From Phase 2, the research approach should be to integrate, as far as possible, the research method of each discipline or group of disciplines. Monthly communication between the project leader and project advisor is seen as an inevitable and necessary requirement to ensure dissemination of information on the project further along to the field team.

In the Bekkersdal pilot study the PA team (five research participants selected as leaders from the original group of 25 research participants) have also suggested that the IMD pilot study group should create a virtual archive in which any information about Bekkersdal is deposited in one central “repository” on the NWU website known as Bekkersdal Home. It is intended that all research participants should use this information in their respective disciplinary research objective(s) and also themselves make research inputs into the Bekkersdal Home website which all research participants could explore. Tolerance, encouragement and patience are part of the package in research of any integrative nature. In this regard researchers, especially in the humanities, can feel very uncomfortable as they are accustomed to feeling, and act “alone” when doing research.

An obvious obstacle that researchers want to overcome in a project of this nature is funding. Some substantial time and fund application proposals were made to be able to sufficiently invest in research of this nature with the intention to expand as well as refine the current research vision.

What may every discipline as a research participant grapple with?
Each discipline, represented by a research participant or a number of research participants, may have to scrutinise their own disciplinary environment for historiographical, theoretical and methodological directions or ideas on how to deal with local ecohealth research from a disciplinary or broader context.

As for the discipline of history (the discipline represented by the author), it appears that very few contributions to ecohealth exist, especially from a local point of view. Whereas historical studies internationally on public health and some health histories (globally and nationally) feature prominently as a baseline for departure in research of this nature, ecohealth-related contributions by historians range from limited to absent.

So far contributions by historians of South Africa to the country’s health history, according to health historian Howard Phillips, have revolved around disease, the patient and the healer. Health histories in the wider context as embedded in themes such as poverty, death demographics, urbanisation and the impact of environmental pollution on humans have not yet been explored with health as the focus. However, local histories, with the multidisciplinary possibilities of their methodology, do sometimes cover health histories from the perspective of town development due to rapidly increasing economic activity. None of these contributions to local history were developed specifically to record deteriorating environments, which cause crises in the ecohealth status of environments, and impact on communities.

A lack of sufficient research on the socio-economic and local histories of South Africa, which also incorporate environment and health histories rather than an over-emphasis on political history, has after many decades allowed a serious knowledge gap to develop, for example in local environmental health histories. The South African Historical Journal (SAHJ) and the national historical journal Historia have published a few articles.
on environmental themes. Perhaps the very first article on local environmental health (although still from a narrow angle) which mainly looked at the health impacts of disease, water provision and racial trends, was by a Finnish researcher, Harri Mäki, entitled: “Comparing developments in water supply, sanitation and environmental health in four South African cities, 1840–1920”. It may be of some value to produce dissertations and theses on the health status in certain regions, but it is my opinion that historians dealing with ecohealth research issues still have a long way to go in South Africa to effectively contribute to IMD-focused discussions.

Many years ago South Africa, in groundbreaking ways, pioneered epidemiological studies in public health research when the Department of Health (DPH) in the 1940s experimented with clinics as a health service in impoverished areas. For example, an epidemiological study was carried out in the Pholela reserve in KwaZulu-Natal with the aim of determining how infectious diseases such as syphilis could be prevented. In this epidemiological study the focus was on the social, economic and cultural dimensions of disease causation. Close monitoring of family health by trained black health assistants became a system, and was key to addressing the health needs of a community such as Pholela. These needs included health education, monitoring of the state of health of families, administering their health progress and providing first aid. This was the vision of Dr Sidney Kark and his wife Emily, who took responsibility for the Pholela “health experiment”. They worked towards a scenario where people would take responsibility for their own health. The then young World Health Organisation learned much from the Pholela experiment, but South Africa did not. A lack of funding, economic dreams, ideologies and racial preferences had always been hurdles to overcome in efficiently carrying out public health research, which should include several disciplines supporting an all-inclusive view for sustainable actions, among others the need for epidemiological studies in communities. Historian Alan Jeeves stated that by 2001 South Africa barely had any health districts with access to usable or sufficient data on their communities. The health history of the Bekkersdal community reveals that, apart from a lack of adequate health services since 1945, the dominant economic activity at the time, namely the surrounding goldmines, did not take great care of employees and families who were socio-economically and culturally disrupted. The present-day impact and possible effects of polluted environments on the health status of the Bekkersdal inhabitants can also be added to the list of ecohealth concerns from a broader angle.

Conclusion

The purpose of sharing information in this discussion was to provide, among others, methodological direction to a broader academic community (especially the human and social sciences) on a possible ways to do integrative multidisciplinary research. This possibility, developed by NWU academics as a self-formulated theoretical research framework (but inclusive of ideas obtained from a solid research in international literature) is currently practically contested. The practical part (as case study and as part of the pilot study which started in February 2011), with ecohealth as theme in a broadly defined context, takes place in the Bekkersdal Township in the Gauteng, South Africa. Impressions on its progress so far were discussed. The 2012-stage of the pilot study will include formal feedback discussions according to the structure of all the phases as set out in Diagram 1. What is worth mentioning in general at this point of the pilot research process is that it was realised that integrative forms of research (from the disciplinary to the interdisciplinary and transdisciplinary) cannot exist automatically, nor all at once. Also both the ID and TD approaches to research are not possible without solid disciplinary research. It also appears that an IMD way of thinking about research will rather emerge from a longer process of planning for implementation to be accomplished in phases, than being put into practice in short-term or hot-spot research. Research should eventually also include the insights and approval of the community on which the research is being done (which is defined as a requirement in phase 3 in Diagram 1 only). The inputs and distribution of the final report should ensure progress towards an integrated form of scientific dissemination that will be a longer-term investment. The IMD research approach in the pilot study in Bekkersdal (to be completed by 2014) will probably transform as a project having progressed from a pilot study towards more in-depth research needs in future. The Model could serve as a research framework example to be applied elsewhere in South Africa, and even internationally as part of current debates.


[4] This trend of regional history’s value has also been observed some time ago by historians in the USA, dealing with The New Western History. See S.H. Armitage, “From inside out: Rewriting regional history”, Frontiers – A Journal of Women’s Studies, Vol. 22, 2001.

force in all careers with specific reference to history training and its career receptiveness”, New Contreec, November 1997.


[18] For a more complete explanation of the research concepts D, ID and TD see for example E.S. van Eeden, Environmental history within a revitalised integrative research methodology for today and tomorrow”, Interdisciplinary Science Reviews, Vol. 36, No. 4, December 2011, pp. 314-329.


[20] Environmental health impact assessments are seen as a multidisciplinary activity, crossing boundaries of disciplines such as Public Health, Healthcare, Environment, the Social Sciences and in some contexts History, Law and Psychology (as part of the Humanities). The Social Sciences include: Business Administration; Economics; Education; Geography; Political Science; Sociology; Linguistics; International Relations; Communication; Anthropology; Archaeology and Criminology. See Department of Health, Environmental Health Impact Assessment (EHIA) in South Africa, Guidelines, May 2010, pp. 8-9.

[21] See this article referred to in EcoHealth, October 1999, pp.11-18. Canadian researchers are regarded as leaders in considering health assessment in impact assessment criteria.

[22] Canada is regarded as a leader in considering health assessment in impact assessments.


[24] Compare this intentional research with recent research foci abroad such as Editorial, EcoHealth, 8 January 2011, pp. 1-3.


[31] A history by the University of Johannesburg is very disappointing and loaded with factual errors. See Westonia, 1948-1992. PREFACE: This project on the history of Westonaria has as its starting point, the initiative taken by the Westonaria town council, … www.westonaria.gov.za/gbWrite.asp?WriteContent=Y&rid...1995, Chapter one.


[35] The Donaldson Dam receives polluted decant water from the Cook construction of Rand Uranium.


[24] To make this statement exemplary by pointing out the South African Historical Journal (Spontaneously regarded to be the leading historical journal in South Africa) a total of only 31 articles from the SAHJ was traced that directly or indirectly cover health histories of South Africa since the foundation of the journal in the 1960’s.


