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

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Science is not only an intellectual and practical activity; it is a social one. The social, intellectual, and practical aspects of science are interlocking and help to characterize the enterprise of science
Collier's Encyclopedia (1994 edition)

The intellectual's task:
To attempt to discern what the phenomenon is;
To attempt to discern what were its origins;
To attempt to discern what are its links with other phenomena;
To attempt to discern what has been its trajectory;
To attempt to discern what we may anticipate its future trajectory to be.
(Wallerstein)[2]

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 in 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 exploring 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.

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

Disciplines: Hitsory, Ecohealth, Multidisciplinarity

Introduction

Interdisciplinary (ID) and transdisciplinary (TD) research co-operations in South Africa within the humanities and social sciences over the past decades can be traced through intervals of time up to 2009.[3] ID cooperation is more common in the natural and agricultural sciences. Numerous educational changes since the mid-1990s supported a debate on the

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2 See Wallerstein's discussion on "The ecology and the economy: What is rational?", A Hornborg, JR McNeill and J Martinez-Alier, *Rethinking environmental history. World-system history and global environmental change,* pp. 379-380.

3 Compare A Goebel *et al.*, "Transdisciplinarity in urban South Africa", *Futures*, doi:10.1016/j.futures. 2009.11.032, pp. 1-9.

status and value of integrated forms of research by disciplines in the humanities and the social sciences.[4]

For example, as long ago as 1997 the Centre for Science Development (CSD) conducted an audit on social science research methodology training in South Africa at universities and universities of technology. The audit covered approximately 15–20 disciplines categorised as part of the humanities and the social sciences. A key objective of the audit was to promote an adjustment in tertiary research methodology in the social sciences which would involve more interdisciplinary co-operation (probably more among the social and human sciences) and inter-institutional cooperation (again, probably more among the social and human sciences). The authors of the report argue that if this were done, it would allow more effective use of resources and that inter-institutional collaboration would also facilitate the sharing of best practice in research methodology teaching.

From the CSD audit another valuable comment was made in favour of integrated forms of disciplinary research and teaching, namely that

> *the whole area of interdisciplinary training is an important focus for closer attention to also overcome unnecessarily narrow disciplinary boundaries in line with international trends in, for example, the social sciences.*

The authors continue:[5]

> *Discipline-specific skills in many areas have only a short life and what will be needed even in the medium term cannot be predicted with any great precision.*

As part of the justification for ID research ventures, the TD focus was also raised as a key element of a "knowledge society" [sic] with the intention of solving problems. Although covered by the audit, no in-depth questions on this form of research were raised. Some general recommendations reflecting both forms of research emerged from the CSD audit, namely that the CSD:[6]

- Should consider facilitating the development of a generic research methodology module at postgraduate level;
- Should involve other relevant stakeholders (including, for example, students, employers and NGOs) in developing its programmes in research methodology;
- Should recognise the value of inter-institutional exchanges in promoting the development of a vibrant research culture;

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4 Compare EJ Hollingsworth, "A multidisciplinary review of the study of innovation ....", *A* transdisciplinary research *Program for the Twenty-First Century, Public,* South Africa, July 7. 1995; Also see *eb.mit.edu/annualreports/pres08/2008.03.00.pdf;* ES van Eeden, *Didactical guidelines for teaching History in a changing South Africa*, November 1999, (Keurkopie, Potchefstroom, 1999), Chapters 8-10.

5 See Higher Education Council, NBEET, "Achieving quality" (Canberra, AGPS), 1992 as quoted by Centre for Science Development (CSD), Human Sciences Research Council, Report, "Social Science research methodology teaching at South African tertiary institutions" (compiled by A Tothill & C Crothers), November 1997, p. 9.

6 CSD, Human Sciences Research Council, Report, "Social Science research methodology teaching at South African tertiary institutions" (compiled by A Tothill & C Crothers), November 1997, pp. 4-6, 33-34.

- Should recognise the growing importance of multidisciplinary research, and should continue to develop and expand programmes which promote such research and address the accompanying organisational and philosophical challenges.

The last recommendation given above, namely the growing importance of integrative multidisciplinary (IMD) co-operation in research and the expansion of educational programmes, do indeed require more focused thinking, even 12 years after the CSD audit was published. As was positively outlined in the audit report, varying degrees of integration are possible, but, "multi- and transdisciplinary research are best viewed on the continuum".[7]

South Africa's Higher Education White Paper of 1997 also endorses an integrative disciplinary approach to research[8] 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.*

I have been involved for years with most types of regional history based particularly on the Skipp Model and some adapted versions the model, and experience over time has shaped my historical thinking.[9] I am convinced that historians (my discipline is history) can deal effectively with ID and TD[10] research in an integrative way (IMD) without forgetting or ignoring their valuable historical (disciplinary) roots.

Regional and local history covers a variety of themes in which human involvement and human interaction, specifically with the environment, is stressed. History's breadth of research field and knowledge at all levels of community also allow the discipline to take the lead in integrative research processes of an ID and TD nature within the human and social sciences, as well as with (and among) other non-related sciences. In the process much is gained. If approached wisely and meaningfully, the fundamental qualities of the discipline will remain the most valuable point of departure in conducting and thinking about research. Environment-related research within the research methodology focus should be appreciated

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7 CSD, Human Sciences Research Council, Report, "Social Science research methodology teaching at South African tertiary institutions" (compiled by A Tothill & C Crothers), November 1997, pp. 33-34.

8 CSD, Human Sciences Research Council, Report, "Social Science research methodology teaching at South African tertiary institutions" (compiled by A Tothill and C Crothers), November 1997, p. 35.

9 I Campbell and K van Rijsbergen, "The Ostensive Model of developing information needs", Accepted to *CoLIS-2*, Copenhagen, October 1996, pp. 1-14; H Joho, J Urban, R Villa, JM Jose, CJ van Rijsbergen (Eds.), Jana Urban (Booklet Editor), First International Workshop on Adaptive Information Retrieval (AIR), University of Glasgow Scotland, UK, 14th October 2006, pp. 1-43; See also ES van Eeden, "Ekonomiese ontwikkeling en die invloed daarvan op Carletonville, 1948-1988: 'n Historiese studie", (Ph.D., PU vir CHO [NWU], 1992).

10 JT Klein, W Grossenbacher-Mansuy, R Häberli, A Bill, RW Scholz,& M Welti, M.(Eds.), *Transdisciplinarity: Joint problem solving among science, technology and society,* Birkhäuser, Basel, 2001, pp. 81-93; 118; JWN Tempelhoff, Oral discussion with ES van Eeden, January 2010; S Baumgärtner, C Becker, K Frank, M Müller & F Quaas, "Relating to the philosophy and practice of ecological economics: The role of concepts, models, and case studies in Inter- and Transdisciplinary Sustainability Research", *Ecological Economics*, 67(3), October, 2008, pp. 384-393.

as additional to the heuristic and methodological features of the discipline. It can be appreciated as a discipline in its "applied" mode in a current context.[11]

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 and to attempt to produce a "package" of research results from many disciplinary angles. The results that will eventually be discussed and refined through interdisciplinary (ID) and transdisciplinary (TD) research phases and will "contain" 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 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.

Understanding the concepts "integrative multidisciplinary" (IMD) research and "ecohealth" research from a broader angle

By *integrative multidisciplinary* (environmental) 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.[12] The ideal is to join together all parts of research that features more than one related or unrelated discipline, and which includes professionals, consultants and community members doing research on a specific local community and its environment. The different "jackets" of science then, as researched in a localised context, must bring about an as "complete" or inclusive informative research outcome as possible so as to contribute meaningfully to the understanding of a specific environment, as well as to critically explore the past, present and future of humankind in that particular environment.

It is in, for example, so-called area studies[13] that opportunities for crossing disciplinary boundaries become apparent, as well as examination and intellectual collaboration of

11 ES van Eeden, "The 21st value of History and the history educator revised – a motivational discourse", *New Contree*, 51, May 2006; ES van Eeden, "History as silent formative force in all careers with specific reference to history training and its career receptiveness", *New Contree*, November 1997.

12 Compare with the views in A Hornborg, "Introduction: Environmental history as political ecology", in A Hornborg, JR McNeill and J Martinez-Alier, *Rethinking environmental history. World-system history and global environmental change* (AltaMira Press, United Kingdom, 2007), pp. 1-2.

13 H Ritvo, "Discipline and indiscipline", *Environmental history*, 10(1), January, 2005, pp. 75-76.

transnational aspects within regional studies.[14] The quest for proper training to accommodate new research trends is repeatedly pursued. In 2004, Katz *et al.* remarked:[15]

> *As historians become increasingly spatial in their analysis, area studies theorists and programs may be helpful partners, while history departments can offer area studies programs, many of which have historical foundations, [as] historical training for their students. And, like history, many area studies programs are moving toward the humanistic disciplines.*

In integrative multidisciplinary studies, one should always embrace one's academic roots and accommodate its research tools in, for example, interdisciplinary and transdisciplinary research environments. Ignorance of disciplinary roots will lead nowhere.[16]

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):[17]

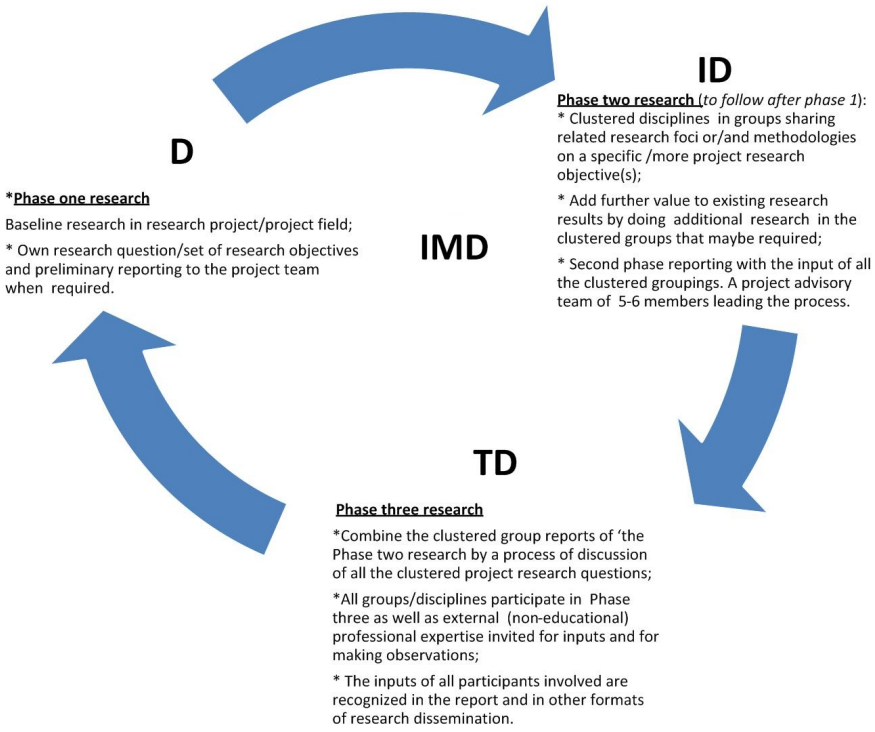

DIAGRAM 1: A suggested research approach to Integrative Multidisciplinary (IMD) research

14 RQ Grafton, L Robin, & R Wasson, *Understanding the environment: Bridging the disciplinary divides.* Sydney, Australia: University of New South Wales, 2005, pp. 1-220. This collection of essays refers to multiple researchers at the Centre for Resource and Environmental Studies, Australia. It is regarded as the Southern Hemisphere's biggest and oldest interdisciplinary environmental research centre.

15 See Katz in the publication of The Committee on Graduate Education of the American Historical Association (compilers: T. Bender, P.M. Katz, C. Palmer), The education of historians for the Twenty-first Century, pp. 1-222; JE de Steiguer, The origins of modern environmental thought. University of Arizona Press: Tucson USA, 2006, p. 202.

16 S Pyne, "Environmental history without historians", *Environmental history*, 10(1), January, 2005, pp. 72-74; P. Sabin, "The ultimate environmental dilemma: Making a place for historians in the climate change and energy debates", *Environmental history*, 15(1), 2010, pp. 76-93.

17 Diagram 1 should also be understood with the visual and explanation of Diagram 2.

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:[18]

> *...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 approach that, for example, includes environmental impact assessments[19] as well as social science impact assessments, are not defined in the EHIA guideline. As a result the research process and methodology of inclusively involving the humanities, the social sciences and the natural sciences in research projects are limited and even ignored.

As far as health research and specifically the humanities are concerned, John Eyeles, Susan Elliott, Jacques Grondin, Karen Smoyer, Ralph Matthews and Dan Krewski reported in "New directions – New dimensions for environmental health research in Canada"[20] that the meaning of "health" has evolved from the absence of disease to a broader, more complete concept incorporating physical, social and emotional factors. This has set the stage for revisiting the biomedical paradigm and developing new models of health and well-being. These pioneering Canadian models emphasise the numerous determinants of health (physical, social, cultural, political and economic). The Canadian Institute of Environmental Health Research (CIEHR) has also developed a useful heuristic tool for understanding the role of the social sciences and humanities in environmental and health research which could be considered for inclusion in an IMD research project.

An IMD impact assessment on the environmental health[21] status of a specific local area should thus depart from the scope of a broader health model. So far in research and

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18 Republic of South Africa, Department of Health, Environmental Health Impact Assessment (EHIA) in South Africa, Guidelines, May 2010, p. 6.

19 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.

20 See this article refered to in *Ecohealth*, October 1999, pp.11-18. Canadadian researchers are regarded as leaders in considering health assessment in impact assessment criteria.

21 Canada is regarded as a leader in considering health assessment in impact assessments.

assessment this suggested focus appears very limited. As recently as May 2011 Morgan reported that:[22]

> *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.*

If ecohealth research could be done inclusively by disciplines across the spectrum, then well-thought-through results, as a consequence of extensive deliberations, could and should lead to solutions or more appropriate local environmental management that may provide constructive positive outcomes.

The local environment/area, IMD research and history

An icon of South African history practice, FA van Jaarsveld,[23] supported disciplinary co-operation between history and other disciplines in the 1970s as an addition to the development of history's expanding focus and fields of research. The then emerging fields of social history[24] and local history[25] in South Africa,[26] for example, paved the way for history researchers to become more aware of regional social trends that allow closer interdisciplinary and even TD research opportunities because of the varieties of knowledge and insight required to conduct quality research in local history, which also includes environmental issues.

From the late 1970s to the early 1980s, local history research developed alongside the ideas of the methodological approach of "History from below",[27] 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 integrative

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22 Richard K Morgan, "Health and impact assessment: Are we seeing closer integration?", *Environmental Impact Assessment Review*, 31, 2011, pp. 405-406.

23 FA van Jaarsveld,"Geskiedenis en relevansie", *Historia*, 24(1), 1979, pp. 14-18; FA van Jaarsveld, "South Africa as an industrial society". *Historia*, 34(1), 1989, pp. 95-99.

24 Kyk FA van Jaarsveld, "Oor die opleiding van geskiedkundiges Deel 1", *Historia*, 16(2) 1971, pp. 74-88; FA van Jaarsveld, "Oor die opleiding van geskiedkundiges, Deel 2", *Historia*, 16(3) 1971, pp. 146-160; DJ van Zyl, "Geskiedenis as vak en wetenskap: Nuwe uitdagings", *South African Historical Journal*,19(1), 1987, pp. 1-5.

25 Compare WM Macmillan's "Complex South Africa, an economic footnote to History (London, 1930) in which Macmillan has pointed out the lack of Social history in South Africa as quoted by FA van Jaarsveld, "Oor die onderrig van sosiale geskiedenis en riglyne vir sy metodiek", *Historia*, 17(2), 1972, pp. 118-133. Van Jaarsveld also has mentioned several examples of Social History like PJ van der Merwe's *Die noordwaartse beweging van die boere voor die Groot Trek, 1770-1842*.

26 C Eloff, "History from below…", Paper, 13th SAHA Conference, Unisa, 22-25 January, 1991, p. 12.

27 Compare for example this approach to History with P J Blok, "Geschiedenis van het Nederlandsche Volk" [seven volumes] as discussed in his inaugural lecture in 1894 in Leiden titled: De Geschiedenis als Sociale Wetenschap. Blok interpreted the Social History as:. "de geschiedenis der menschelijke maatschappij". As quoted in FA van Jaarsveld, "Oor die onderrig van sosiale geskiedenis en riglyne vir sy metodiek", *Historia*, 17(2), 1972, p. 119.

multidisciplinary (IMD) approach to research (see discussion below on a pilot study in progress in the Bekkersdal area).

Views on contemporary ID and TD[28] research methodologies could to a greater or lesser extent be associated with some of the historiographical trends of the Wits History Workshop.[29] Historians, archaeologists, educators, political scientists, geographers and sociologists were key professionals associated with the academic activities of the Wits History Workshop Group.

In local environmental history research, the use of a "TD research approach" also became readily applicable because of its inevitable connections with communities, their local environmental experiences and the wealth of oral history about their area. The many voices, debates and differences in statistical data, together with intellectuals' thinking and debating on environmental ethics, justice, human and legal rights, environmental pollution, environmental crime and hydrosolidarity,[30] allow environmental history research from a broader TD angle. At least in South Africa Carruthers noted that:[31]

> *there is …an overall absence of active collaboration between historians and other disciplines" in the human and social sciences who also at least make use of chronology in their research methodology... A special plea should be made around the need for greater indigenous knowledge…in southern African environmental history…'scholarly expertise should not subordinate the experiences and knowledge of ordinary people'…understanding the social history of the communities that lived in them is imperative. Active collaboration with other disciplines is also imperative. The environmental and agricultural sciences are obvious partners, but archaeology and explorations into even deeper time with the assistance of climatologists or paleo-anthropologists and the like would add immeasurably to the stature of environmental historians as mediators and bridge-builders between knowledge areas.*

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

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28 A conceptual discussion on the Interdisciplinary and Transdisciplinary research methodologies is not covered in this discussion. For a conversation and references related to these concepts see ES van Eeden, *Impressions on conducting and reporting interdisciplinary and transdisciplinary environmental research in South Africa – a historian's perspective* (Inaugural lecture 07/2010, Platinum Press, NWU, Vaal Triangle Campus (ISBN: 978-1-86822-588-3), March 2010; RH Roberts and JMM Good (Eds.), *The recovery of rhetoric. Persuasive discourse and disciplinarity in the Human Sciences* (Bristol Classical Press, London, 1993), pp. 1-22. These authors , amongst others, discuss the territorial boundaries and rhetorics of interdisciplinarity.

29 K Smith, K. *The changing past. Trends in South African historical writing* (Johannesburg, Southern Book Publishers, 1988), pp. 165-167; 185-187; ES van Eeden, "The 21st value of History and the history educator revised – a motivational discourse", *New Contree*, 51, May, 2006.

30 N Jacobs, *Environment, power, and injustice: A South African history* (Cambridge, Cambridge University Press, 2003); ES van Eeden, "Debating the role of History within an extensive transdisciplinary research methodology on environmental crisis research: The former Far West Rand region of South Africa as example", Paper, South African Historical Society Conference, Grahamstown, 5-9 July 2008.

31 J Carruthers, "Transnational and transdisciplinary aspects of the environmental history of Africa", Keynote address, International Conference on Humankind at the Intersection of Nature and Culture, Kruger National Park, 4-6 September 2006, p. 5; S Dovers, "On the contribution of environmental history to current debate and policy", *Environment and History*, 6(2), 2000, pp. 130-152.

holistic, as well as useable, form of research reporting. In South Africa and abroad a few history-related publications on integrative research possibilities have so far caught the eye. Three examples worth mentioning are that of Anne Stahl,[32] Virginia Berridge[33] and Alan Jeeves.[34] Stahl relied on a case study of Ghana to view an opinion that the "coming to know" understanding in history through an inclusive engagement of empirical and narrative data in the understanding of past socio-historical processes helps to produce effective histories known as "total history". In many ways "route work through alternative archives" is not a choice for historians engaging in local history but an obligation. Local history issues, such as environmental pollution and its possible impact on the health of local communities, also allow historians to further engage with alternative sources and "archives" and research methodologies.

In 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:[35]

  …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…

Indeed, a search for human truths and social science generalisms which carry over into geography and time, and which will benefit users such as policy makers, should be considered in historical research into local environment-related health (ecohealth). This includes clear, systematic reviews and interaction as well as communicative opportunities on health. Berridge also remarked that the role of health in local governments is one of the under-exploited historical areas.[36]

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32 AB Stahl, "'Route work' through alternative archives: Reflections on cross-disciplinary practice", *South African Historical Journal*, 62(2), 2010, pp. 252-267.

33 V Berridge, "History matters? History's role in health policy making", *Journal for Medical History*, 52(3), July 2008, pp. 311-326.

34 A Jeeves, "Public health in the era of South Africa's syphilis epidemic of the 1930's and 1940's", *South African Historical Journal*, 45(1), 2001, pp. 79-102.

35 V Berridge, "History matters? History's role in health policy making", *Journal for Medical History*, 52(3), July 2008, p. 324.

36 V Berridge, "History matters? History's role in health policy making", *Journal for Medical History*, 52(3), July 2008, pp. 324-326; V Berridge and M Gorsky, "The importance of the past in public health", *Journal of Epidemiol Community Health*, 58, 2004, pp. 728-729.

In turn, Alan Jeeves's (historian) argument goes back in time and refers to local history scenarios in mining areas in the days of South Africa's Department of Public Health (DPH) which worked under the Public Health Act of 1919 and has since operated as a sub-department under the Department of the Interior. The 1919 Act held municipal departments responsible for safeguarding local public health. Notable in the historical discussion by Jeeves[37] (considering the pilot study of Bekkersdal's history discussed in the next section) are his observations from research that:

> *...throughout the interwar period [in South Africa], the goldmines were in the midst of a slow, grudging and long-overdue reform of their medical system... It remained policy to repatriate workers who became sick or disabled when 'fit to travel'. This tactic reduced the need for expensive hospital treatment and removed such workers from the official statistics of accident, disease and death that the state required the mines to maintain.*

The so-called "mine medical rejects" which Jeeves refers to were apparently simply "ejected" from the compounds, and had to find other ways to earn a living. Numbers of miners apparently died along the public roads and in railway stations and carriages. As large employers of labour, most mines had health departments. In the past several of these mines launched or requested scientific research projects to be undertaken to determine the incidences of some diseases and illnesses such as tuberculosis. Unfortunately, most mines were not good at recording sufficient data (or perhaps they were deliberately "good" at not doing so), so research was mostly not sound or was not possible at all.

Apart from the value of History when it comes to local environmental health research dissemination (the plea by Berridge) and the value of a form of "total history" (Stahl's thinking) I have also learned from the research by Jeeves that, due to a lack of integrative research by the mid-1920s in South Africa (so by the way at the time of the Department of Public Health's existence, and researchers simultaneously noting the interdisciplinary-like Annale School of thought) very few researchers and other members of community recognised the close relationship of environmental factors to the health status of local people. No researchers in the humanities carried out integrative research.[38]

Though many academics explore the possibilities of integrative research, 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.

Identifying a research team, a geographical setting and a research focus for IMD

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

37 A Jeeves, "Public health in the era of South Africa's syphilis epidemic of the 1930's and 1940's", *South African Historical Journal*, 45(1), 2001, pp. 80,85.

38 Compare ES van Eeden, EJ Nealer & M Liefferink, "A historiography on past scientific research and references to environmental health concerns in the Merafong [City] gold mining region of South Africa", *New Contree*, 58, November, 2009.

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.

The outcome 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)?

Research aims:

I. To provide opportunity for the humanities, the social sciences and (occasionally) other related and unrelated environmental and health sciences to cooperate and to progress towards developing and refining a workable research methodology which is efficient in ecohealth research of an IMD nature within the broader human experience as a focus.

II. To conduct IMD research to obtain research data on human health and well-being in Bekkersdal from a broader conceptual angle that will make it possible to offer solutions from an integrative multidisciplinary angle.

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).[39]

No integrated multidisciplinary research on ecohealth risk from a human perspective has been done to date on the impact of industrial pollution in formal and informal communities in South Africa. Nor can local communities and local and provincial governments rely on any integrated research information or view regarding the effects and impacts of economic activities on the environmental ecology and its possible wide range of effects on the human health status of their regions. Studies to complement an integrative research methodology on broader ecohealth risks among local communities such as the Bekkersdal community were regarded as due, and it could be of immense value to address and understand ecohealth issues from a broader perspective. This research approach in the pilot study in Bekkersdal (to be completed by 2014 as a project having progressed from a pilot study to in-depth research) could serve as a research framework example to be applied elsewhere in South Africa, and even internationally as part of current debates.[40]

Research partners from a broad disciplinary spectrum in South Africa (but mostly from the North-West University) were invited to participate in the Bekkersdal pilot study. Several showed an interest to invest time in the Bekkersdal pilot study because they either had a need to explore the feasibility of integrative research and/or a need to explore the broader definition of ecohealth in a demarcated local context through the inputs of several disciplines. Some spatial and historical information was distributed to allow researchers to familiarise themselves with the context and to propose some ideas for the framework (and also to suggest ways of refining it).

After a one-day workshop in early June 2011, a group of 25 people (representing 10 different disciplines or constituencies) met near Bekkersdal. This group decided, among other things, to devote more time to deliberating on their role in the process of integrating knowledge and the specific disciplinary-based research objective(s) they would want to address (see Diagram 1).

To support the research participants with a practical understanding of the IMD research methodology intended, speculations were formulated of possibilities regarding the research objective(s) as options for the initial research input(s) by each discipline and distributed by the project leader for response and reformulation if needed (see these speculations in Diagram 3).[41] The involvement of disciplines is depicted visually in Diagram 2:

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

40 See sources referenced later on in the proposal and RJ Quigly and LC Taylor, "Evaluating health impact assessment", *Public Health*, 118, 2004, pp. 544-552; D Porter, "Being fit to live in the twenty-first century: health bodies and somatic maps", in *Health, civilization and the state. A history of public health from ancient to modern times* (Routledge, London, 1999), pp. 147-196; 281-313; GJ Andrews & RA Kearns, "Everyday health histories and the making of place: the case of an English coastal town", *Social Science & Medicine*, 60, 2005, pp. 2697-2713.

41 Some research objectives may appear to be too broad in a disciplinary context. Obviously it will not be able to all be covered in-depth in the Bekkersdal pilot study. However, if the participants that represent each discipline, accept these objectives (even after refining them to be more focused), an in-depth research will only commence from 2012 in an extended post-pilot research opportunity.

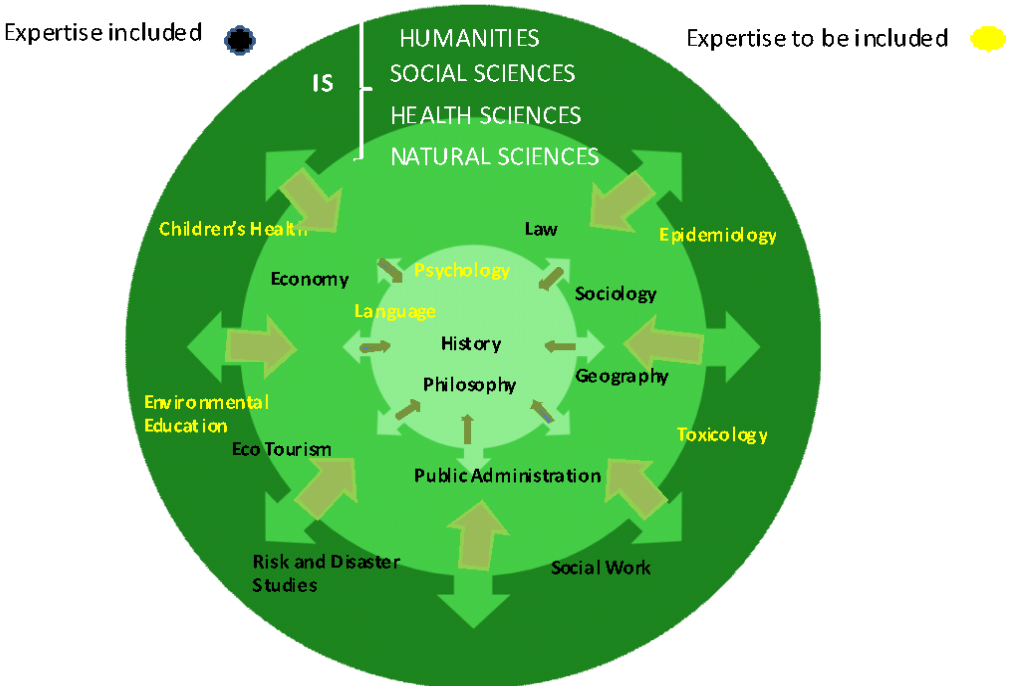

DIAGRAM 2: Disciplines involved in ecohealth research themes in an IMD context – Bekkersdal Pilot Study, 2011–2014[42]

The visual of the three circles should be understood as follows: the research theme is explored, for example by the human sciences and social sciences in the core as the major participants and the group leading the Bekkersdal project. It should gradually expand with research needs "outwards" to involve more disciplines in this integrative multidisciplinary research possibility. Opportunities to be enriched or guided with ideas from other disciplines also involve the "applied sciences" (such as sociology, law, economy, public administration and geography), and are reflected in the middle circle. Other applied sciences that also regard themselves as functioning in interdisciplinary ways have been accommodated (such as risk and disaster management, social work and ecotourism).

Currently most of the disciplines/groups involved view themselves as disciplines dealing with aspects of ecohealth in an indirect way. It is 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 suggestions of disciplines/groups in 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 (see the research flow indications in Diagram 1).

42 The skeleton structure for this visual was borrowed from the discussion by cira.ornl.gov, "Human health risk assessment (HHRA)", Oak Ridge national laboratory (as accessed on http://cira.ornl.gov/hhra.html on 23 June 2011).

- **Philosophy:**

Research objective: An ethical view on the current ecohealth scenario in Bekkersdal

Research objective: Sustainability and tensions between nature and culture

- **History:**

Research objective: To record and historically analyse information and published research that should reveal the health history status of the Bekkersdal community since 1945

Research objective: To record oral and written information (the latter in popular and scientific writing) on the responses/impressions of the Bekkersdal community members regarding their (polluted) environment.

- **Law:**

Research objective: Mapping the Bekkersdal community's perspectives and knowledge on environmental law policies

Research objective: Deliberating on legal issues regarding the impact of environmental pollution on the health of children with a focus on Bekkersdal

- **Geography:**

Research objective: Geographically and demographically positioning Bekkersdal in the pilot study

Research objective: A GIS approach towards environmental risks that may have health impacts on the Bekkersdal community

- **Risk and Disaster Studies:**

Research objective: Risk assessments/baseline risk assessments (such as the Bekkersdal community's perceptions of environmental hazards)

Research objective: Support the identification of criteria in doing IMD impact assessments that complement ecohealth research.

- **Sociology:**

Research objective: Analysing the social structure (including family and other institutions as well as cultural aspects (values, norms, customs, beliefs, etc.) of the Bekkersdal community.

Research objective: Exploring theoretical models and following development plans to target different social issues (e.g. health, deviant behaviour, family disorganisation, migration, etc,) in the community.

- **Social Work:**

Research objective: Identifying the factors affecting the psycho-social well-being of the Bekkersdal households.

Research objective: Determining the role the environment plays in the psycho-social well-being of Bekkersdal households.

- **Public Administration:**

Research objective: Identify the local municipality's/government's service delivery obligations and difficulties experienced regarding Bekkersdal

Research objective: Identifying shortcomings perceived regarding local government of local environmental issues (including health issues)

- **Economy:**[43]

Research objective: Provide statistical information on the Bekkersdal community's perspective of their well-being (population demography, income/jobs, food intake; illness in households, perspectives of the/their polluted environment)

Research objective: Providing perspectives on implementing possible economic practices in Bekkersdal to improve community well-being and future sustainability

- **Ecotourism**:

Research objective: To identify the tourism potential of Bekkersdal and its environment to improve the well-being of the local community.

Other possibilities of research cooperation in the humanities, education and the health sciences to include in the ecohealth studies from a humanities and social sciences angle in the Bekkersdal IMD pilot study

Psychology: The environmental resilience (flexibility/toughness) of local communities

Language: Exploring possible communication difficulties by communities in expressing/understanding (environmental) health concerns in their local environment

Environmental education: Mapping the status/expansion of informal (economic) activities that complement the environmental needs for environmental awareness and implementing, among others, the *re*-culture (such as *re*mediate, *re*cover, *re*cycle, etc.)

Children's health/well-being: Assessing the ecohealth status of children with the intention of suggesting solutions in revised policy aimed at the protection of children

Toxicological and epidemiological studies by environmental health and discipline-specific experts to address the validity of anecdotal evidence and to provide/suggest solutions to address any negative outcome and/or to report any anecdotal truths and/or/flaws

DIAGRAM 3: Possibilities for research objective(s) in Phase 1 by discipline[44]

43 The contribution of economists may be part of the neoclassical economics that claims to be holistic and not to engage in methodological individualism. See JE Harford, "Economics and public health: an exploration", PhD Thesis, University of Adelaide Australia, 2006.

From Diagram 3 some unavoidable overlapping foci in the research objectives are noticeable (but this is regarded as a positive feature which allows baseline research from multi-perspectives, which should be refined in the clustering process during the ID phase, known as Phase 2, as outlined in Diagram 1). Also noticeable from Diagram 3 is the focus on providing information that will support the development of solutions to enhance the local community's well-being despite possible ecohealth destructions.
It was also decided by the group of research participants of the Bekkersdal pilot study that any other discipline that does promote an ecohealth focus in its research and supports the research protocol (as outlined in Diagram 1) that has been developed for IMD research in the preliminary stages of the Bekkersdal pilot study, may also become involved.

From the defined research protocol, a group of people of high integrity and legitimacy drawn from specific constituencies have been (and should be) identified to become involved in the third phase of the research report ("TD phase"). During this phase this group, specifically for Bekkersdal, should include at least one or two people with adequate knowledge and experience of, for example, the mining industry, government, local government, area, national and local non-government bodies, a national person of influence (a person representing a national-level special interest group that has a high moral foundation) and a local person of influence. The availability of an international expert with extensive experience in IMD-like research will be of benefit to expand the group's research vision in the form of ecohealth-related integrative research.

Familiarisation with concepts, the context and other "how's" of the Bekkersdal pilot study area

To be able to commence with the IMD pilot research of Bekkersdal on an informed and healthy footing, a few other aspects of preparation that were required are explained in a question and answer form.

What is a pilot study and why Bekkersdal?

The locality of Bekkersdal (in the Westonaria municipal region) 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 research background while being unfamiliar with this specific environment and to apply their disciplinary skills and knowledge obtained from research in other areas to make their first phase contribution to this study (see Diagram 1).

A pilot study, also called a pilot experiment, is defined as a small-scale preliminary study which is conducted before the main research to check the feasibility or to improve the design of the research. Pilot studies, therefore, may not be appropriate for case studies. They are frequently carried out before any large-scale qualitative and quantitative research, in an attempt to avoid time and money being wasted on an inadequately designed project. This is the narrow focus, although the outcome should certainly be of value for decision makers. A pilot study is usually carried out on members of the relevant population, but not on those who will form part of the final sample. This is because it may influence the later behaviour of research subjects if they have already been involved in the research.

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44 See Diagram One for the core Phase One inputs by disciplines as suggested.

Therefore the research support and input of the IMD research participants in the pilot study of Bekkersdal will include, for example, 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 surface, 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.

Where is Bekkersdal and what is known?

Bekkersdal is currently part of greater Westonaria and its population of 153 614 people[45] forms part of the inhabitants of the West Rand District Municipality.[46] Bekkersdal's history[47] still needs to be extensively researched, so currently we are relying on snippets of information from Westonaria's past.[48] Bekkersdal township is situated 7 km east of Westonaria and 14 km south of Randfontein in Gauteng. Bekkersdal was established in 1945 to house Africans who worked in the surrounding towns and gold mines (see map below):

45 The Municipal 2008-2009 report relied on the Draft Economic Growth and Development Strategy for the West Rand, October 2005 (data provided by Global Insight Data).

46 Westonaria Local Government, Annual Report, 2008-2009, as accessed from http://mfma.treasury.gov.za/Documents/06.%20Annual%20Reports/2008-09/02.%20Local%20Municipalities/GT483%20Westonaria/GT483%20Westonaria%20Annual%20Report%202008-09.pdf.

47 See for this info Westonaria, 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.

48 A draft history of Westonaria, done by the University of Johannesburg, as available on the Internet. It appears to be a very disappointing history, loaded with factual errors. See Westonaria, 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.

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

On 27 October 1948 the status of town council was granted to Westonaria and much later, in 1983, the Bekkersdal Township was established with full municipal status. By 2009 Bekkersdal's population was approximately 89 400, of whom 30 000 lived in backyard shacks, 9 000 in formal settlements and 50 400 in informal settlements.[49]

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

49 Westonaria Local Government, Annual Report, 2008-2009, as accessed at http://mfma.treasury.gov.za/Documents/06.%20Annual%20Reports/2008-09/02.%20Local%20Municipalities/GT483%20Westonaria/GT483%20Westonaria%20Annual%20Report%202008-09.pdf.

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 1942.50 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.[51] Recently air pollution concerns have been mentioned.[52]

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 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.[53] The inhabitants are also close to the Donaldson Dam[54] (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

50 A history by the University of Johannesburg is very disappointing and loaded with factual errors. See Westonaria, 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.

51 See Westonaria, 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 nine.

52 The Westonaria Municipal report, 2009-2010.

53 See www.environment.co.za on "Radio-active rivers – The Brenk Report – Environment South Africa, 22 May 2010.

54 The Donaldson Dam receives polluted decant water from the Cook construction of Rand Uranium.

catching fish to eat which they should not actually do. They sell food close by, and allow animals to drink from the dam.[55]

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), a few decisions were made in the past four 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"[56] when doing research.

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.[57]

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55 Compare NNR Report – TR-RRD-07-0006 – "Radiological Impacts of the Mining Activities to the Public in the Wonderfonteinspruit Catchment Area." 12 July 2007 as obtained in Federation for a Sustainable Environment, Hearings, 21-22 June 2011: Environmental reliability, pp. 7-8.

56 Compare J Holmes, A Lehman, E Hade, A Ferketich, S Gehlert, G Rauscher, J Abrams and C Bird, "Challenges for multilevel health disparaties research in a transdisciplinary environment", *American Journal of Preventative Medicine*, 35(2), Supplement 1, August 2008, pp. S182-S192.

57 Compare J Eyeles, S Elliott, J Grondin, K Smoyer, R Matthews and D Krewski, Report: "New directions – New dimensions for environmental health research in Canada", October 1999, pp. 1-38 . This research was research funded by the Social Sciences and Humanities Research Council as well as the Canadian Health Services Research Foundation. In this research the Canadian group strongly suggested comparative and historical humanities investigations. See p. 13; LM Anderson, SC Scrimshaw and JE Fielding, "The community guide's model for linking the social environment to health", *American Journal of Preventative Medicine*, 24(3S), 2003, pp. 12-20.

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.[58]

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.[59] 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.[60] 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[61] 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

58 Compare A Yankauer, "Public health then and now", *American Journal of Public Health*, 69(2), 1979, p. 122; V Berridge and M Gorsky, "The importance of the past in public health", *Journal of Epidemiol Community Health*, 58, 2004, p. 728; V Berridge, "Teaching History in a medical school", *Wellcome History*, 1997, pp. 23-35; GJ Andrews & RA Kearns, "Everyday health histories and the making of place: the case of an English coastal town", *Social Science & Medicine*, 60, 2005, pp. 2697-2713; G Rosen, *A history of public health*, Expanded edition, (John Hopkins University Press, Baltimore and London), 1993, pp. 1-530; D Porter, *Health, civilization and the state. A history of public health from ancient to modern times* (Routledge, New York), 1999, pp. 1-365.

59 H Phillips, "Report on health", Manuscript prepared for the Cambridge History of South Africa, ca 2011, p.3. Also see the following for some early examples of the health histories as mentioned by Phillips: DJ van Zyl, "Phylloxera Vastatrix in die Kaapkolonie, 1886-1900: Voorkoms, verspreiding en ekonomiese gevolge", *SAHJ*, 16, 1984, pp. 26-49; Norman Etherington, "Missionary doctors and African healers in mid-Victorian South Africa", *SAHJ*, 19, 1987. pp. 77-91;HJ van Aswegen, "Myntering en die goudmynwerkers aan die Witwatersrand 1886-1920", *SAHJ*, 21, 1989, pp. 55-71; E van Heyningen, "Poverty, self-help and community: The survival of the poor in Cape Town, 1880-1910", *SAHJ*, 24, 1991, pp. 128-143 and E van Heyningen, "Recent research on the Social History of medicine in South Africa", *SAHJ*, 45(1), 2001, pp. 178-190.

60 See for example J Mathew, 'Environment and empire', *South African Historical Journal* 61 (3) 2009, pp. 639-654, that focuses only on the environment with no health aspects referred to. A typical narrow definition of health by the government of the day is accentuated in Susanne Klausen's, "Poor whiteism', white maternal mortality, and the promotion of Public Health in South Africa: The Department of Public Health's endorsement of contraceptive services, 1930-1938", *South African Historical Journal*, 45, November 2001, pp. 53-78.

61 Compare for example J Nauright, "'An experiment in Native self-government': The Alexandra Health Committee, the State and local politics, 1916-1933", *South African Historical Journal*, 43, November, 2000, pp. 223-243; GH Vahed, "A 'Public health nuisance': The Victoria street early morning squatters market, 1910-1934", *South African Historical Journal*, 40, May 1999, pp. 130- 153; T Maloka, "'White death' and 'Africa disease': Silicosis on the Witwatersrand gold mines", *South African Historical Journal* 34 (May 1996), pp. 249-254. Only once did this author refer to the health of the mineworkers, so the economic impacts was emphasised much more than the health.

local environmental health histories. The South African Historical Journal (SAHJ)[62] 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".[63] 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.[64] The then young World Health Organisation leaned 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[65] stated that by 2001 South Africa barely had any health districts with access to useable 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.

62 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.

63 See H Mäki, "Comparing developments in water supply, sanitation and environmental health in four South African cities, 1840–1920", *Historia* 55(1), Mei/May 2010, pp. 90-109.

64 A Jeeves, "Public health in the era of South Africa's syphilis epidemic of the 1930's and 1940's", *South African Historical Journal*, 45(1), 2001, p. 92.

65 A Jeeves, "Public health in the era of South Africa's syphilis epidemic of the 1930's and 1940's", *South African Historical Journal*, 45(1), 2001, pp. 79-102.

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 ways to implement integrative multidisciplinary research. A pilot study was started in early 2011, and impressions on its progress so far were discussed. One observation so far 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. 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. Although the pilot study of Bekkersdal to determine the efficiency of IMD has not yet been completed, progress so far has been very satisfactory. It should allow others to benefit, and if considered and adapted, should bring about revitalised methodological insights.