

CONNECTING RESEARCH TO COMBATING DESERTIFICATION

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Abstract. With and without the encouragement of the United Nations Convention to Combat Desertification and its Committee on Science and Technology, scientific research has been undertaken throughout the drylands with the expectation of contributing to combating desertification. Little of this research has been applied in developing countries for its identified purpose. The main reason for this is the limited translation of scientific research into an accessible format for application by development agencies or rural communities.

Keywords: desertification, research, research communication, UNCCD

1. Introduction

Since the global recognition of processes of desertification during the 20th century, research has been applied by scientists to address emerging issues (UNCOD, 1977; Darkoh, 1993). Currently, desertification is defined as: 'land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities' (UNCCD, 1996). This definition clearly supports the basis for a relevant research programme to combat desertification and for training people to undertake this research. Inclusion of climatically defined, geographical areas in the definition reflects early research activities and has shaped ongoing research. At the same time, the Convention to Combat Desertification (UNCCD) focuses on community involvement and the expectation that local people living in the drylands will address issues on their own with minimal support from external agencies.

Research on desertification has been undertaken in all relevant academic disciplines although efforts have focused on bio-physical manifestations of desertification (Darkoh, 1993; Jacobson, 1997) where the greatest competence exists. This includes descriptions of the climate in areas where desertification occurs and establishing the extent of variability or directionality of change. The extent and progress of land degradation has been a focus of research including the bio-physical and socio-economic processes involved and potential remedial measures and their impacts (Darkoh, 1999; Seely and Jacobson, 1994).

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Recognition of the central role of human activities in processes of desertification has taken a longer time to become established (Darkoh, 1996; Lorimer, 1999; Mortimer, 1987; Seely, 1998; Stiles, 1995). Supporting research in socio-economic fields, in policy and governance, in economics, in communication and similar fields has gained increasing acceptance but remains far from sufficient.

The UNCCD requests and expects a large contribution from the research community and has established the Committee on Science and Technology to coordinate these efforts. This committee emphasises the need for research despite the lack of evidence that the results of research have been put to any direct use outside developed countries, or those in transition, where information is accessible and translation of results into specific actions is possible.

Despite knowledge gained from ongoing research efforts, desertification continues to affect millions of people and square kilometers of land. Although Africa is the focus of attention, land degradation is affecting significant numbers of people throughout the drylands. In view of the long-term recognition of processes of desertification and application of research, questions must be posed concerning the value and applicability of the research being undertaken, particularly in Africa. Have research efforts to date made a contribution to combating desertification, or does any future research have the potential to do so? Moreover, communication of that research through the weak links existing between research and research results on one hand, and implementation of programmes to combat desertification funded by governments, NGOs and multi- and bilateral donors on the other, must also be questioned. Are governments, NGOs and donors taking up the results of research and applying them to combating desertification?

2. Links Between Research and Combating Desertification

Taking the African example, four groups of institutions are centrally involved in combating desertification and potentially using research results: local communities, local non-governmental organisations, development agencies and international non-governmental organisations, and local and international research institutions including universities. These institutions differ in fundamental ways as summarised in Table I.

Although some members of all the identified institutions are involved in combating desertification, there are different perceptions of the role of research in this process, and differing degrees of application of research results.

For research to be incorporated into the process of combating desertification, links to facilitate information flow should exist among researchers, local and international development agencies, national and local extension services, and drylands communities experiencing desertification. Research results should be accessible to desertification practitioners at all levels and offer direct and immediate benefits. Publications are one mechanism for research information to be disseminated. To

- Development programmes could revisit the role of research in development programmes and incorporate a framework for applied research. This would include mechanisms to ensure that results of relevant research can be identified, understood and used by resource users and decision makers working at the national and local levels and so that these partners, in turn, can contribute to generating research ideas.
- Scientists and development agencies should strengthen capacities to communicate (translate) results of research as well as identify and strengthen mechanisms of communication (translation) of research results.

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TABLE I
Comparison of four groups of institutions involved in combating desertification that could contribute to or benefit from the results of research

Attributes	Communities	Local NGOs	Development agencies	Research institutions
Structure	Traditional	Informal	Formal	Traditional
Rewards	Improved livelihoods	Recognition of project	Recognition within agency	Recognition in scientific community
Basis of reward system	Improved livelihoods	Project reputation	Reports, evaluations	Publications (esp. peer reviewed)
Information dissemination	Exchanges through government and NGO structures	Reports, workshops	Reports, agency publications	Peer reviewed & other publications
Time frame in projects	Life time, full time	Months to decades, full time	Several years, full time	Months to years, often 'field season'
Educational background	Range from traditional knowledge to well educated	High school and above, often well traveled	Several years, full time MSc to PhD	MSc to PhD
Political involvement	Often extensive at local level	Often extensive at local level	Aware, not involved internationally	Aware, not involved internationally
View of research	Irrelevant	Irrelevant	May be useful	Essential

TABLE II

Content analysis of all papers (not only those related to combating desertification *per se*) in selected journals reflecting levels of direct applicability to community action (1997–2001, based on analysis of abstracts)

Journals analysis 1997–2001	Total number of papers	Pure science papers	Papers that could be applied		Papers with direct relevance to communities	
			No.	(%)	No.	(%)
Ambio	390	383	26	6%	16	2%
Journal of arid environments	656	581	46	7%	12	1.8%
Conservation biology	694	598	110	15%	22	3%
Ecology	1251	1251	0	0%	0	0%
Haramata (2001 only)	11	0	10	91%	10	91%
Oecologia	1512	1508	4	1%	1	0%

assess the status of the publication link, we investigated the papers published in six journals for the past five years (1997–2001) (Table II). The journals represented a range of interests and editorial policies.

From the brief overview of the applicability of journal papers to communities involved in combating desertification, it is clear that few published research papers in peer reviewed journals are of immediate or even future applicability. Possible explanations for this lack of direct relevance stem from the difference in the institutions involved (see Table I) and in the processes applied by these institutions. The scientific process is based on an explicit conceptual framework embedded in scientific theory. In contrast, the development process is based on a broad, flexible conceptual framework focused on the needs of drylands communities.

Expectations amongst the institutions involved also vary. Researchers and developers expect to gain understanding of a situation while communities believe they understand the problems at hand. Scientists expect to contribute to available information and perhaps theory. All three groups wish to contribute to increased sustainability of resources while particularly drylands communities expect increased natural resource productivity as well. Researchers and developers expect to enhance their own recognition and reputations and to advance in their own organisations. Communities, on the other hand, are interested in immediate and direct income or livelihood benefits that may, secondarily, include practical guidance and enhanced skills to improve their livelihoods and incomes.

Amongst researchers, differences also exist among those from universities in dryland countries and those from universities in developed countries. There are still a limited number of local scientists in Africa and a small number of acknowledged local institutions. Moreover, most are geared toward research and research systems prevailing in the north and aspire to recognition by northern researchers and systems.

and used by decision makers at all levels including those making policies, using natural resources or involved in development. Consideration should be given to three essential points.

- It is essential that questions should be identified that policy and decision-makers, resource users and researchers feel would enhance understanding of desertification and contribute to its reversal.
- Participation of local researchers, of resource users and of people involved in development programmes is one of the ways that enhanced understanding can be generated.
- Interpretation of research results, so that they are in context and understood not only by academics but also by decision makers, resource users and people focused on economic development, is another essential step towards enhancing understanding based on research.

These points require competencies that are not usually in the training, experience or reward system of academic researchers.

Two processes are in place to enhance the integration of research into combating desertification. Neither focuses on strengthening capacity to communicate results as a primary aspect of research directed toward combating desertification. The development of NAPs is one process that requires competence in implementing research and understanding, communicating, and incorporating research results into the NAP. Similarly, the establishment of the CST within the UNCCD is another process that requires broad competence in research and communication of research results. Researchers and developers alike look forward to these processes defining, elaborating and assuming their intended roles in enhancing broad-based research competence in combating desertification.

If appropriately translated and made available, research results could inform basic awareness leading to project formulation by communities and development agencies. They could also apply to project development and implementation throughout the entire process, as well as promoting general good practice. To be of use in this manner, appropriate 'translation' of research results is essential.

4. Recommendations

- Scientists, working particularly with development agencies, could shift their approach to ensure the application of results as well as the usual research outcomes. This would include creation of a clear understanding of the application of the research results, and the manner in which they will be communicated (translated), before research is undertaken.
- Similarly, scientists could shift their approach to ensure some meaningful level of participation by development agencies and resource users in the identification of research topics and the actual research.

Academically, the strongest research capacity lies in the developed countries and areas where desertification is not taking place. This research is driven, funded and evaluated by an academic accreditation system based on peer review, predominantly in the form of literature in recognised journals. Research competence is assured at this level by this process. However, information from this research is largely unavailable and transmission links, e.g. from academic researcher to developers or extension workers, are not functioning and are mainly absent. This strong academic system eliminates participation by researchers in most developing countries, by persons involved in development programmes, and by people affected by and affecting processes of desertification. Similarly, the aim of communication is also muted as academic, peer reviewed journals are not necessarily accessible to persons outside of the developed world's research community. Even if publications were physically available, unless the material is 'translated' into practical, user friendly language, the research results are largely inaccessible. In addition, there is a lack of appropriate communication channels and networks that are actively maintained and involved in transmitting the messages derived from research results. These channels and networks should be transmitting understandable research results to politicians and decision-makers, policy makers and market regulators as well as resource users and their service organisations and community-based organisations.

From within the research process it is clear that changes need to be made, in many instances, in the focus of research. A first question needs to be: for whom are the answers being sought and what is the intended application of the results? Equally important is the communication of results, by all involved parties. However, most often, there is a lack of ready mechanisms for the 'translation' of scientific results and this step is not built into the overall research programme.

Do researchers and programme implementers have the required competencies to address translation and enhanced communication? Clearly these issues must be addressed in a more creative and systematic fashion than has been done before. Examining the UNCCD (1996), it is apparent that the Committee on Science and Technology (CST) should be a driving force in this regard. However, till now, it has not adequately recognised or addressed this challenge.

The central role of research should revolve around enhanced understanding by all parties involved in the processes of desertification and its reversal. Since the ultimate causes of desertification are recognised as ranging from inappropriate policies and their application, to an increasing population expecting improved livelihoods from diminishing natural resources, to inappropriate development interventions causing reduced rather than increased overall productivity, the topics for research are boundless. The main issue for desertification research is: How can the understanding generated be applied to reducing or eliminating desertification? How can it be communicated and integrated into development work?

Enhanced understanding as a result of desertification research often refers to scientific understanding by the involved researchers. However, such enhanced understanding is of no value to combating desertification if it is not accessible to

As a consequence, local researchers and institutions emulate northern attitudes and focus on projects that lead to publications within current scientific concepts. Often the reward for successful researchers from developing countries is a permanent position in a northern university. These attitudes are reinforced by the decrease in funding for research in agriculture and drylands rural areas while the focus shifts to other economic issues. Most local researchers are dependent on external or donor funding as funding from their own institutions is usually limited.

Research in the context of desertification control should be judged not only for its direct applicability by communities but also for its applicability by development agencies, extension agencies and others involved in communicating with and supporting communities to combat desertification. However, till now, there has been very little communication among the different institutions and their respective systems are not inter-linked.

By examining general good practices by researchers, by development and extension agencies and by local communities, we can observe similarities in the process that could serve to enhance communication amongst the groups and, in turn, enhance their capacity for combating desertification. Table III provides an overview of similarities among community action, extension and development, and research approaches, and indicates the changes required for bringing the approaches closer together.

From the analysis of reports from National Action Plans (NAPs) to the UNCCD, communication has been identified as a severe bottleneck (e.g. African Regional Conference on the Review of the Implementation of the UNCCD, July 2002). At the community level 'translators' of scientific results are generally not available. Communities have not been empowered to take advantage of such results, nor are their social institutions sufficiently developed to do so. Similarly, development agencies do not have ready access to understandable research results in the course of their normal programmes.

3. Discussion

Although research is expected to have a major role to play in combating desertification, most research undertaken in the name of desertification has not contributed to reducing or reversing its impacts (e.g. Jacobson, 1997). Reasons for this are manifold but can be largely attributed to inadequate communication by researchers with those affected by and involved in combating desertification. Most researchers are proficient in their specific research field, but rarely have the interest or competence for taking their research further. Participation and communication have been implicitly recognised in the UNCCD (1996) although not stated clearly nor explicitly enough to be adopted in a meaningful way. To date rhetoric has overshadowed the application of research. The communication of research results, rather than research *per se*, requires attention.

TABLE III

Overview of the processes of research, development and extension, and community action as they could apply to combating desertification. (Process detail [in square brackets and italics] indicates the changes that would be required to bring the three processes into closer alignment. All steps are best undertaken using an iterative, consultative and participatory approach.)

Community action	Development projects	Science/research
<i>Individual or committee:</i>	<i>Agency (NGOs, government) based on country priorities:</i>	<i>Individual or research group:</i>
<ul style="list-style-type: none"> Identifies action to be taken Consults with other community members 	<ul style="list-style-type: none"> Identifies projects/programmes Consults widely within agency and country at different levels 	<ul style="list-style-type: none"> Identifies research question (s) Discusses informally and formally with colleagues [and communities and other stakeholders]
<ul style="list-style-type: none"> Identifies and consults with other communities, extension workers, NGOs or other information sources] Develops action plan [On participatory basis] 	<ul style="list-style-type: none"> Consults sources of information from advisors and similar projects/programmes globally Develops action plan on participatory basis within framework established by agency and country(ies) 	<ul style="list-style-type: none"> Undertakes initial literature review Develops research plan using informal peer review process [in consultation with communities and other stakeholders]
<ul style="list-style-type: none"> Drafts proposal Discusses proposal with community members [And other stakeholders] 	<ul style="list-style-type: none"> Drafts proposal Discusses and reviews proposal widely, within agency and with other stakeholders [including research and rural communities] 	<ul style="list-style-type: none"> Drafts proposal Arranges for proposal to be reviewed by colleagues [and community representatives & other stakeholders]
<ul style="list-style-type: none"> Revises proposal Submits proposal to funding agencies for review and possible funding 	<ul style="list-style-type: none"> Revises proposal Submits to funding sources 	<ul style="list-style-type: none"> Revises proposal Submits proposal to funding agencies for review and possible funding
If funded:	If funded:	If funded:
<ul style="list-style-type: none"> Establishes steering committee Implements actions [Documents: actions, approaches, results (good and bad, expected and unexpected), consultations, analyses, budget] Disseminates: approaches, actions, results, changes of direction, reactions of community [and other stakeholders]; through discussion, workshops, [posters, presentations, exchanges] [and appropriately translates for varied audiences] [Monitors: approaches, actions, results, changes of direction, reactions of community, decision makers and other stake holders] [Evaluates: approaches, actions, results, changes of direction through reactions of community, decision makers and other stake holders] [Documents and disseminates: results of monitoring and evaluation, and adjustments based on reactions of all stakeholders] 	<ul style="list-style-type: none"> Establishes steering committee Establishes programme of implementation [Documents: actions, approaches, results (good and bad, expected and unexpected), consultations, [analyses], budget] Disseminates: approaches, actions, results, analyses, changes of direction, reactions of community and other stake holders; through discussion, workshops/ conferences, posters, presentations, agency reports, subject newsletters [and appropriately translates for varied audiences] [Monitors: approaches, actions, results, changes of direction, reactions of community, decision makers and other stake holders] [Evaluates: approaches, actions, results, changes of direction through reactions of community, decision makers and other stake holders] [Documents and disseminates: results of monitoring and evaluation, and adjustments [based on reactions of all stakeholders] 	<ul style="list-style-type: none"> Establishes research guidance committee Undertakes research [Documents: materials and methods, results (useful and not useful), analyses, ongoing literature review, budget] Disseminates: methodologies, results, analyses, comparisons with other research world-wide; through internet, presentations, posters, seminars/ conferences, peer-reviewed publications, subject newsletters [and appropriately translates for varied audiences] [Monitors: research methodology, results, analyses and interpretations; response of researchers, [decision makers, community and other stakeholders] [Evaluates: methodology, results, interpretations through peer reactions and interactions [and reactions of decision makers, community and other stakeholders] [Documents and disseminates: revisions of research analyses, interpretations [and reactions of all stakeholders]