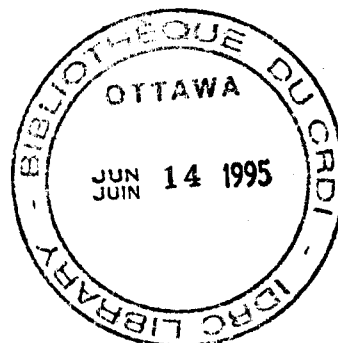


THE INTERDISCIPLINARITY IN INTESEP

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The Interdisciplinarity in INTESEP

Present times are characterized by very rapid change and increasing complexity and interdependence. The conventional response by both scholars and policymakers has been to split complexity into manageable pieces for reflection and action. Scholars have therefore tended to concentrate on disciplines while policymakers focused on sectors.

In the last three decades, the recognition of the finite limits of our natural environment has created an urgency in tracing connections between our personal and social choices and the environment. The need to acknowledge this interconnectedness has brought an increasing emphasis on an understanding of complexity as an integrated whole and not merely as a sum of parts studied separately. This focus on interconnectedness has supported efforts in integrating varying disciplinary perspectives in both problem analysis and policy formulation.

This paper looks at interdisciplinarity as one of the ways that could facilitate this integration. It also contributes to the discussion on the policy research prerequisites of sustainable development as outlined in Agenda 21, the global action plan drawn up in the 1992 Environment and Development Conference. Chapter 8 of Agenda 21 is entitled "Integrating Environment and Development in Decision-making". It states that the separation of economic, social and environmental factors in decision-making affects the sustainability of development. In keeping with this, IDRC has chosen "INTESEP" (Integrating Environmental, Social and Economic Policies) as a core theme for its research programme.

The main implication of the INTESEP theme for the research process is that it requires that the traditional realms of economic and social policy research open up to each other and to the newer domain of environmental policy and examine how the three can best interact in the interests of sustainable development. This implies consideration of how the disciplines usually associated with such research - disciplines such as sociology, economics, political science, zoology, botany, etc.- might interact to produce recommendations for public policies which recognize and address the linkages between sectors that have been viewed as separate e.g. economic planning and development, education, housing, environmental management or the management of natural resources. There are indeed linkages between these seemingly disparate domains and INTESEP can make these connections explicit and amenable to policy discourse.

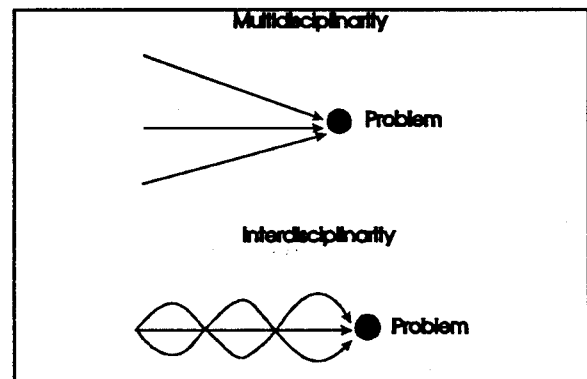
The methodologies for tracing the linkages and formulating an integrated approach in analysis, planning and policy are still at the stage of exploration and development. Much remains to be learnt about the options in this process. Interdisciplinarity is one of these options. The following sections discuss what is meant by interdisciplinarity and what its role in INTESEP research could be.

Definitions

The term that describes the use of more than one disciplinary perspective in the consideration of an issue is called crossdisciplinarity. It is an umbrella term for two kinds of processes which involve the application of several different academic disciplines to explain or solve a problem (i.e. multi- and inter-disciplinarity).

The distinction between the two terms refers mainly to the degree of consultation and co-operation between the disciplines during the research process. In "multidisciplinary" research, different disciplines have parallel input without necessarily consulting with each other. "Interdisciplinary", on the other hand, implies some degree of integration between the different disciplines in relation to the problem at hand. It may involve consultation at the research design stage, as well as during the research process itself. The distinction is illustrated diagrammatically in Fig.1 below.

While multidisciplinary can mean simply the juxtaposing of disciplines in the exploratory process, interdisciplinarity is a pooling of knowledge. The focus in the latter would be on intersections between disciplines ¹. Multidisciplinary is characterised by a low degree of integration; it is more a mosaic of different disciplinary inputs. Interdisciplinarity means a higher degree of integration in the process and results of research.



A succinct listing of the main components and stages of interdisciplinary research and analysis is given by Dirk van Dusseldorp²

(1) studying the same object (2) at the same time (3) by members of different disciplines (4) in close cooperation and (5) with a continuous exchange of information, (6) resulting in an integrated analysis of the object under study.

¹ George Gusdorf, "Past, present and future in interdisciplinary research", International Social Science Journal, Vol.XXIX, No.4, 1977.

² Dirk van Dusseldorp, "Integrated Rural Development and Inter-Disciplinary Research: A Link Often Missing" in Baker J.I. ed., Integrated Rural Development Review, University of Guelph, 1992.

The interdisciplinary approach to problem solving is also characterised by the attempt " to reveal and deal with complexities in some rather direct participatory manner"³. In other words, the problem is approached with a research design and a research team that reflects as far as possible the key facets of the issues's complexity and the concerns of those who are affected by it.

In INTESEP research, the preferred mode is interdisciplinarity and the goal is integrated policies i.e. policies which are cognizant and reflective of the implications for each other. This requires both in the research and policy realms an iterative process of exchange and feedback between the different actors.

Assumptions

Our discussion on interdisciplinarity with regard to INTESEP is based on certain premises and these are outlined here.

- i. That IDRC supports applied research (i.e. research for the solution of problems and research that can contribute to policy formulation).
- ii. That IDRC recognizes the role of disciplinary as well as crossdisciplinary research in responding to development problems.
- iii. That disciplinary expertise is often called upon to contribute to the planning of different public sectors. Therefore greater interdisciplinarity at the research and planning stage could enhance inter-sectoral communication and consultation at the policy level.
- iv. That INTESEP research requires consideration of both biophysical and socio-economic dimensions of a development issue.

Development, disciplines, interdisciplinarity and integrated policy

Disciplines are branches of knowledge, many of which originated in nineteenth century Europe for the purposes of instruction ⁴. Disciplines are a means of understanding the world and passing on the knowledge thus acquired. This understanding however is developed within the conceptual boundaries and the analytical framework of the particular

³ J. Dryzek, " Ecology and Discursive Democracy " in Capitalism, Nature, Socialism, 3(2), 1992, quoted in Francis G. " Ecosystems" , paper presented to the Social Science Federation of Canada, Ottawa, Feb. 1994.

⁴ J. Vickers et al, "Interdisciplinarity" , Working Documents, Carleton University, 1992.

disciplines. The disaggregation of knowledge embodied in disciplines is also characteristic of formal learning institutions and therefore would also influence the kind of policy advice that emerges from these.

Human motivation, development activity, communities, reality - these are integrated processes (in the sense that everything relates to everything else). Our grasp, our understanding of these may be from partial standpoints, but the world is a complex web that we continue to attempt to break into microscopic parts that we can study and manipulate. When we try to re-shape parts of the web with our understanding and manipulation, it might well have the effect we expected but almost invariably it will also have other effects that we may or may not grasp. Cross-disciplinarity and in particular interdisciplinarity is an attempt at grappling with more of the complexity of the real world than is possible through the monodisciplinary approach. The assumption is that there are development issues which would benefit from the wider input. At the same time, the broader spectrum of input would add some complexity to the research process as well.

There are costs to interdisciplinary research that must be considered at the outset. In comparison to the monodisciplinary approach, the interdisciplinary approach involves more people, money and time and demands skills in team management. There has to be clear communication between the researchers, co-ordination and co-operation and joint decision-making; in other words, a strong commitment to teamwork.

The overall goal that we in this meeting are concerned with is that of "development". It is not a coincidence that we should be having a discussion on interdisciplinarity at a time when the development paradigms that have guided policies and activities for the last fifty years are being seen as largely redundant. A central premise of these paradigms was economic growth along a linear progression with the western industrial state being the hazy utopian image on the distant horizons of this line. That cannot be. And so, as greater credence is lent to the possibility of nurturing a more "organic" view of development that recognizes diversity in modes of development depending on local foundations, there begins to be a corresponding acknowledgement of more systemic or holistic approaches to analysis.

A characteristic of these emerging approaches is greater emphasis than before on public participation in research, planning and policy development. The aim is to establish and maintain dialogue between researchers, policymakers and the communities and other interested parties (private sector companies, non-governmental organizations etc.) who might be affected by particular decisions. This relationship has been called in the research parlance "vertical linkages". The participatory process can identify key issues for research. "Horizontal linkages" can connect members from the different disciplines involved in research on the integration of environmental, social and economic decision-making. Figure 2 attempts a visual representation of these linkages.

The donor can play the role of the catalyst, stimulating the articulation of the problem in community interest, and promoting interaction between the constituencies and the researchers as well as across disciplines.

INTESEP and Interdisciplinarity : The Research Process

INTESEP is an interdisciplinary research area for integrating social, economic and environmental policies. It aims at bringing together insights from resource management / environmental issues (which are usually considered the domain of natural sciences) and social and economic policy research (which would tend to be done by social scientists). The rationale for interdisciplinarity in INTESEP is well stated by Paul Stern⁵

Research must be interdisciplinary because human-environment relations are natural and technological as well as behavioral and because the relevant human actions are those not only of individuals, but also of communities, organizations, and political-economic institutions.

While reviewing in the following discussion the various stages of the research process, it would be wise at the same time to keep in mind that interdisciplinarity is not an area of clear-cut methodologies. There is no general prescription "which amounts to a methodology in the narrow and well-understood sense of the term... In other words, the problems of interdisciplinarity will always require increasing ingenuity and creativity" ⁶. Choice of the methods will derive from the analysis of the problem and the discussion in the planning and preparation stage of each project.

Another important point to note is that in an interdisciplinary project, the research skills of exploration and analysis are just as much at the core of the research process as in monodisciplinary research. What is different is the continual interaction, exchange and influence between the different members of the team, who come from different disciplinary backgrounds.

I. Preparation: Planning the Research

Preparation for interdisciplinarity does not necessarily begin with the project. Its base is prepared through interactions that academics, researchers, policymakers and various other interests might have beyond their own specialized areas. This foundation is dependent upon

⁵ Paul Stern, " Psychological Dimensions of Global Environmental Change",

⁶ Jonathan Broido, " Interdisciplinarity : Reflections on Methodology" in Kockelmans Joseph J. Interdisciplinarity and Higher Education, The Pennsylvania State University University Park, 1979.

ongoing networking and exchange between people in different sectors and disciplines and their openness to each other and the changes and challenges this might bring.

Effective policy research requires familiarity with the decision-making process and institutions within government. Links between research institutions and policy makers have to be developed and maintained throughout the research process ⁷.

i) Problem identification

During the process of problem identification, a first question that would be asked is "whose problem is it; who identifies the problem?" INTESEP has set the research parameters in terms of the interdisciplinary and policy dimensions, but within this context, the community, policy makers and the researchers would contribute to the definition and the focus of the problem. In the case of INTESEP, the focus is policy research and therefore it is essential that the policymakers' definition of the problem is incorporated into the research agenda as much as possible.

The first step in problem definition is to acknowledge that the problem calls for an interdisciplinary approach rather than a monodisciplinary or a multidisciplinary one. Working across disciplines is a "given" in the INTESEP context since the theme area spans across social, economic and environmental issues. However judgement has to be made on the degree of integration that would be required and the depth of the disciplinary expertise that might be called for by the problem that is to be researched. This question would begin to be answered as the problem definition process uncovers the various facets that interact in the subject area of the research.

Different ways of involving the users of research output can be encouraged (i.e. community meetings and roundtables). Community facilitators can help with the articulation of the problem. Roundtables can sharpen focus on the problems that have been identified. The researchers need to be sensitive to community needs even when these are not explicitly outlined (i.e. consideration of the impact of the research on the community). The participatory process is not unique to interdisciplinarity and is in fact being increasingly used in a variety of research settings.

In policy research, the issue is sometimes largely that of the clarification and elaboration of the various dimensions of a policy issue. This has been termed "the enlightenment function" of research ⁸. At other times, the focus is on the solution.

⁷ David Glover "Policy Researchers and Policy Makers : Never the Twain Shall Meet?" paper presented at IDRC.

⁸ C.H. Weiss, "Research for Policy's Sake : The Enlightenment Function of Social Research" in Policy Analysis (3), pp 531-545.

The stage of problem identification is crucial to the outline of the research design, the creation of a vision of the solution and the recognition of skills required to arrive at that solution. Before moving to the stage of data collection, all involved must have a shared understanding of the problem at hand⁹. Amongst other things, this means making explicit the assumptions that everyone brings to the project about the problem, the research goal and the key terms. For example, researchers and users would need to define their understanding of salient concepts such as "community needs" or "costs". The same words can be used to convey different meanings to different people.

To get the research question right, the focus needs to be on the problem and the issues it generates and not on disciplinary perspectives per se. What disciplines are to be used to thoroughly research the problem could be decided after a clear definition of the problem and the various dimensions that need to be investigated.

ii) Team selection

The selection of disciplines for the research team would respond to the problem or research question in hand. It would also be influenced by an analysis of the interests involved in the policy research process and the expertise required to investigate the issues brought forth by them. A scan of these interests through documentary research and brief interviews with representatives would outline some of the key issues that influence the research question and need to be considered within the research process.

As far as possible, team composition should be flexible so that additional members can join and leave as the project progresses. The core team however should remain the same as far as possible through all the stages. A limit to the size of the core team should be considered in order to optimize the potential for effective teamwork.

Once the team is in place, it can jointly formulate the research design in terms of who does what, when, where, and with what. It is imperative that by this stage, there is a shared understanding in the group about what the research problem is.

The two examples below illustrate how the selection of team members follows from the initial diagnosis on the dimensions and research components of the problem:

- * a recent project supported by IDRC on sustainable economic development research in fact drew on not only economics, but education, health, demography and natural resource management expertise.

⁹ Julie Klein, "Applying Interdisciplinary Models to Design, Planning, and Policy-Making" in Knowledge in Society: The International Journal of Knowledge Transfer, Winter 1990-1, Vol.3., No.4, pp 29-55.

- * another on the establishment of a cassava flour sector included agronomy, engineering, food technology, business administration, agricultural economics, and farmers' associations.

II. Data Collection and Analysis

While interdisciplinarity promotes a wider span of inquiry, it should not mean loss of focus. To be comprehensible and goal-oriented, the research needs to be controlled along the objectives derived from the problem definition, otherwise data gathering can be a bottomless pit.

The guiding principle for all stages of the interdisciplinary process is synthesis and integration of perspectives from the different disciplines and of the different stakeholders (such as the target community, NGO active in the area, policymakers etc.) at the various stages of the process. The analytical and conceptual structures that are used by the different disciplines have to be amenable to "translation" so that members of the research team can understand the purpose and rationale for their use in the research context. The ability to communicate and collaborate is very much at the heart of interdisciplinary research.

In a recent review of some IDRC projects which have attempted interdisciplinarity, it was noted that where there was regular communication and exchange amongst the disciplinary experts and between the researchers and research users, there developed over time an ease with each other's language and methods. For example, in Uganda, a project on the use of local fertilizers in agriculture has a team which consists of a geologist, a social scientist and soil scientists. From the outset of the project, the group has had monthly meetings to exchange notes and plan the next steps. Joint field trips have meant that informal exchanges have contributed to teambuilding. Secondly, the fact that the work of each one is premised on that of the other ensures genuine rather than cursory exchange and interaction. The soil scientists rely on the geologist to collect the fertilizer samples which they then test on crops; the sociologist looks to the soil scientists to see what fertilizer mixes need to be introduced to the communities; and the soil scientists in turn wait to hear from the sociologists about local farming practices. Without this interaction, there could be no meaningful research.

In keeping with the communicative character of interdisciplinarity, there would also in most cases be regular consultation and exchange of data and tentative conclusions between the team members and the end-users of research. Another example from Uganda serves to illustrate the point. The Fish Commodity Systems project has a policy component regarding the regulation of common water resources and the marketing of fish. The co-ordinator of the project noted in a recent conversation that what distinguishes this project from "traditional" research is that whereas in the monodisciplinary approach there is weak linkage between researchers and the users of the research, in this project "virtually everything including trip reports" is circulated to all the people who comprise the users (the policy-

makers and the community i.e. those who are affected by the policy decision) as well as the researchers. Plans are revised as comments and reactions are sent in.

An observation from 'Managing Interdisciplinary Research Teams'¹⁰ aptly describes the data collection and analysis stage:

This phase calls for careful dovetailing of the practical requirements of multiple and overlapping sub-studies being conducted simultaneously ...Frequent but brief discussions are essential, as are patience and tolerance by all....there will be constant need to check up on the categories used by other researchers and the detail of their findings for comparative purposes and participants need to be stimulated to do this rather than simply analyzing their own work as if it existed in a vacuum.

The co-ordinating of the simultaneous studies and the exchange between the researchers of the process of data collection is what distinguishes the interdisciplinary process from monodisciplinary or multidisciplinary research processes. In the latter, the distinct studies would stay separate rather than overlapping.

In interdisciplinary research, the basic tools for research and analysis remain those of the disciplines constituting the team, although the understanding gained through these various perspectives is certainly influenced by the fact that there is more than one discipline involved in the process. In fact, the dialectical interplay between the disciplines can enrich the individual disciplines.

The analysis is conducted with the recognition of the interdependence between the different aspects of the problem. The regular communication among researchers and between researchers and users is meant to ensure that important interactions between the different aspects of the research problem are not overlooked.

Personalities of the researchers play a role in the degree of interaction that takes place. Where the protagonists can be open and sharing, there is more progress. The physical proximity of the research institutions in the Ugandan case supported the ongoing dialogue. In India, the distances between institutions even within a city and the constraints in communication infrastructure sometimes lead to a wariness of multi or interdisciplinary processes. The management of a team which is scattered geographically can be taxing enough to take away from the research work of the team leader. An option to consider is the hiring of a co-ordinator/administrator. On the other hand, some researchers interviewed in Uganda and India were of the opinion that central control of the budget by the lead researcher was a powerful incentive to efficient teamwork!

¹⁰ C. Jackson, Managing Interdisciplinary Research Teams: The ICRA Experience, ICRA, the Netherlands, 1993.

III. Synthesis

The value of interdisciplinarity is gauged in the process of synthesis. Whereas multidisciplinary brings together findings in a cumulative way (issue by issue, chapter by chapter), the interdisciplinary research process aims at integrating the findings of the various research components.

What is meant by integration in this context? One observation worth noting is that of Hugh Petrie who writes that it involves the learning "of at least part of the cognitive maps of other disciplines to be used in research"¹¹ The interdisciplinary research process could be seen as on-the-job learning about other disciplines. Another observation is that of Jill Vickers¹²

By interdisciplinary integration I mean a genuine cross-fertilization between (among) disciplinary knowledge in which the new whole is greater than the sum of its parts, in which the more powerful insights of the disciplines can be employed and in which disciplinary knowledge is used "respectfully and respectably".

The first step in the synthesis and reporting stage would be the sharing of findings. The core team will have the responsibility of integrating the data or if the team wishes, the team leader(s) can be given that task. Each team member however should have the opportunity to make suggestions on how the integration should be done, although if the diagnosis and problem definition had happened in sufficient detail, the report would mostly be a response to that. The building blocks of the final synthesis, the different components and their findings have to be outlined.¹³

In commenting on interdisciplinary agricultural research experience, Jackson outlines the tension between group consensus and individual interpretation in this phase. Since individual sections are circulated and commented on by all members of the research group, there might be comments that the individual researcher might not want to recognize or concede to¹⁴. In this case, the disagreement has to be addressed and resolved and that might not always be in a direction that he or she personally agree with. Groupwork does impose some restriction on individual freedom that might not be acceptable to some.

¹¹ H. Petrie, "Do you see what I see? The epistemology of interdisciplinary inquiry", Educational Researcher, 1979.

¹² J. Vickers, op cit.

¹³ Dusseldorp op. cit..

¹⁴ C. Jackson, op cit.

A basic prerequisite for successful synthesis is the same as that for the interdisciplinary process per se i.e. openness and respect for each other's discipline and the continuous recognition of a common goal. There is always the possibility that the bias of one particular discipline will predominate, but if the problem definition has given equal emphasis to the variety of issues, then the synthesis needs to reflect that too. The quality of the synthesis will depend, among other things, on the quality of inputs given by the disciplines and the process of interaction during the research process.

IV. Presentation of findings

The research report is an opportunity to contribute to the shaping of the policymakers' understanding of the research problem beyond their initial perceptions. The synthesis should be presented in a format that is amenable to use within the policy mechanisms that exist. Another objective at the synthesis stage should be to state the findings in a way which can enhance public debate on the policy issue(s) in question. What needs to be remembered in the formulation of the options and recommendations is that research findings form only a part of the influences on policy and that as far as possible, other forces such as the political pressures of the time, should be considered as the context for the recommendations.

Policy research findings can be used to develop policy options with the pros and cons of each option outlined. This involves the anticipation of future problems based on the ability to forecast the possible consequences of a given action. This ability, in turn, will depend on the knowledge generated on the environmental, social and economic processes in the study area. And this leads back to the fundamental role that disciplinary knowledge and expertise have in good interdisciplinary work. It is through the disciplinary skills that many of these processes are discerned, but it is through interdisciplinarity that their interrelationships are traced. As well, innovative definitional and conceptual work can be stimulated through the interaction of the disciplines.

Workshops where the recommendations from the research are presented and discussed with the project stakeholders could be scheduled at a draft report stage so that if there are clarifications or points of information that would enhance the recommendations, they can be included in the final report.

V. Conclusion

Agenda 21 is providing much of the momentum behind INTESEP's encouragement of interdisciplinarity. Conventional specialised and discipline-focused research is not enough for the integration of environment with development. The participatory process that is proposed as a part of the integrative steps outlined in this paper, also serves to articulate different views on the integration of environment with development at the national and local levels. The specific purpose of INTESEP is to strengthen capacity to integrate

environmental considerations into sectoral planning and development efforts. Interdisciplinarity can contribute to the achievement of this integration.

The discussion above presents some suggestions on how interdisciplinarity might be achieved. It remains to be re-emphasized that the integrative process is communication - intensive and that different degrees of integration will correspond to different situations and resources and skills available.

Working beyond the borders of one's own discipline raises questions to which there are no clear answers at present but to which responses will develop alongside the practice. Some of these are: What standards of intellectual or theoretical rigour can be applied to such research? Is there need for a theoretical base to interdisciplinarity? Or, is interdisciplinarity to be seen as a new "empirical discipline"? How do we measure the effect of interdisciplinarity? How do we know whether the extra costs have been worth the results or is it that in some subjects this is the only way to go, regardless of the extra expense and effort?

For interdisciplinarity to be encouraged, research institutions have to acknowledge that it needs to be supported through sustained capacity building, training and a reward system distinct from the one that exists for disciplinary excellence. This creates the challenge of channelling some of the resources from the more conventional disciplinary groupings and departments. It also means sensitizing policymakers and resource allocators to the need for the interdisciplinary approach. The INTESEP theme is a way of beginning this process of sensitization and exploring the possibilities and conditions for more integrated policies in your particular region.