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**DONOR CONSULTATION ON AGENDA 21 RESEARCH AND CAPACITY-BUILDING  
INITIATIVES**

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**DONOR APPROACHES TO  
RESEARCH CAPACITY DEVELOPMENT  
AND THEIR RELEVANCE TO ENVIRONMENTAL  
RESEARCH**

*BACKGROUND PAPER 2*

*Prepared for:*  
IDRC and SAREC  
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on environmental research and capacity building

*Prepared by:*  
Carl Widstrand, Digamma International  
Development Consultants, Ottawa

*with input from*  
Rebecca Aird, Marbek Resource Consultants, Ottawa

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There is legitimate concern that human knowledge, skills and social organization may not keep pace with the forces leading to environmental deterioration and associated conflict. ...It is clear that the existence of a science base in each country is essential to well-reasoned global as well as national approaches to environmental issues. . . Environmental research capability is a pre-requisite for "informed consent" to environmental constraints in both industrialized and developing nations." Developing countries are home to 80 percent of the world's people but less than 10 percent of world research and development activities." Many countries in the developing world have little or no indigenous capability to understand and analyze environmental issues.

Carnegie Commission. *International Environmental Research and Assessment. Proposals for Better Organization and Decision Making*. A Report of the Carnegie Commission. New York: Carnegie Commission. July, 1992.

This paper deals with three different aspects of research capacity development:<sup>1</sup> Environmental research capacity development must first be considered briefly in its context of a nationally based, environmental management capacity. Fundamental issues in research capacity development such as constraints and problems are then discussed. This discussion leads to a review of donors' approaches to research capacity development, now and in the past. Finally, the questions if any of these modalities and approaches are conducive to environmental research issues and if are we supporting the right type of institutions are discussed. Some ideas in this paper were suggested by officers of a variety of institutions in interview sessions during May and June, 1993.

## 1. The context of capacity development

### 1.1. Capacity development

Capacity development may be defined as the actions needed to create or enhance the capability of a country or an institution to carry out its allotted functions and achieve its objectives. For example, "The basic purpose of UNDP assistance is to help the Government achieve the objective of self-reliance through strengthening its capacity to become so." <sup>2</sup> Capacity development in this large sense includes "institution" building and a wide variety of issues.

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<sup>1</sup> Following the lead of GTZ we prefer to use the term capacity development as more process-oriented than capacity building

<sup>2</sup> UNDP. *Capacity Building and Technical Cooperation - Managing the Connection*. New York: UNDP 1992; UNDP. *National Capacity Building*. Draft Report for the Administrator to the 40th Session of the Governing Council, New York: UNDP 1993.

Research capacity development must be considered in context. Research, for example environmental research, does not exist in an empty space. The fundamental issues here are related to the total national environmental management situation. It is obvious that global research cooperation presupposes functioning national programmes. General capacity development is the base and rationale for much collaboration between donors and between donors and recipients. For most donor organizations, general capacity development is an important part of their philosophy and of their technical cooperation history.

We need to look at two aspects of capacity development in the environmental field. The first and maybe most obvious is capacity development for research in the field. The second aspect is the development of capacity to manage environmental problems.

## 1.2. Capacity development for environmental research

There are many good and well-known reasons for the need for support for research capacity development. In the context of this paper the discussion is complicated by the fact that *Agenda 21* is not dealing with research in a consistent way. Although *Agenda 21* does not seem to make environmental research a major issue, it stresses (a) the need to strengthen the scientific base of environmental management for sustainable management, and (b) the need for support for university training as well as for support to other, local research organizations. The recognition of these needs is discussed in many reports, mostly taking what could be called a "deficit" approach. The discussion is based on two premises both dealing with lack of research capacity:<sup>3</sup>

First, there are real gaps in knowledge that need to be filled by research. They include global, local and regional issues. In order to solve them there is a need for researchers and thus for research training.

Then there is the necessity to have people with some kind of research training at the national level to apply these research results and to fill the many administrative posts that will be needed for environmental management. There must be national capacity to perform the

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<sup>3</sup> BMZ. "Umwelt und Entwicklung. Bericht der Bundesregierung über die Konferenz der Vereinten Nationen für Umwelt und Entwicklung Im June 1992 in Rio de Janeiro," *Materialien* 84, Bonn: BMZ, November 1992. BMZ. "Umweltschutz in der Entwicklungszusammenarbeit. Eine Stellungnahme des Wissenschaftlichen Beirats beim Bundesministerium für Wirtschaftliche Zusammenarbeit," *BMZ aktuell*, Bonn: BMZ April 1991.

long-term analyses of environmental consequences of societal activity, to do scenario research, to create environmental monitoring methods and to develop national environmental standards.

However, support for research training at the various levels needs different approaches. These include various types of research training, various modes of cooperation between universities (South-South and North-South, joint research projects), as well as support for infrastructure and for local research funds.

The magnitude of both the immediate and the long-term demands of *Agenda 21* argues for a discussion of the possibilities of a general common approach to research capacity development. A similar idea has been put forward by UNEP for general environmental capacity building.<sup>4</sup> "Sporadic and disjointed programmes and means of delivery used in the past will not serve the future demand...It is surely now time for a broader cooperative effort." The UNEP document also sets out some useful concepts concerning the capacity development needs of the whole environmental sector. But its prescriptions have a kind of standardized, "manual"-based approach to meeting those needs. This type of advice has apparently not been that well received. Rather, the key issue is a need for tools of analysis to understand where different countries stand on the environmental issues and what their priority needs are. This argues for an individual, tailored approach rather than a common approach.

**Box 1.**

**Chapter 31 of *Agenda 21***

Chapter 31 of *Agenda 21* deals with science and technology. It stresses the necessity of better understanding and communication between science and technology, between decision-makers and scientists as well as the development of rules and research policies. There are suggestions for research councils and committees consisting of researchers and politicians or decision-makers, for better training of decision-makers in scientific questions and especially for trans- and interdisciplinary efforts so that more practically useful research goals will be set up.

The report mentions increased regional cooperation between private and public NGOs in training, increased competence in those advising the government and consulting for it; greater efforts of dissemination of research results; increased cooperation between private and public research organizations in order to devise industrial strategies; improvement of the role of women in science and technology; increased sensitivity among researchers as to the environmental fall-out of their research. It is suggested that countries scrutinize their legal instruments and their policies for environmentally sound and sustainable development internationally and nationally and that they put more effort into discussion and policy-making in the fields of environmental ethics and the understanding of environmental issues among the general population. This would include changing curricula in schools and universities as well as developing new research policies. These are important wishes but difficult to translate into reality.

<sup>4</sup> UNEP. *UNEP Paper on Environmental Capacity Building for Sustainable Development*, Nairobi: UNEP March, 1993 (William H Mansfield).

### 1.3. Capacity development for environmental management

The other major issue is the problem of capacity development in the field of environmental management. To manage sustainable development is a major issue in *Agenda 21*. The national aspect is here very important. In order to be sustainable, management for sustainable development must be nationally based, it must be a national responsibility and in some sense it must be permanent in the face of financial or other constraints. The management of environmental problems is a major part of the whole question of sustainable development. There is thus a need for a clear government commitment, and for an integration of measures and environmental institutions into the national administration.<sup>5</sup>

Furthermore, we must ask how capacity development for environmental research fits within the larger goals of nationally based environmental management capacity. There are many and various all-inclusive points of view on this issue. The integration of environmental concerns into comprehensive strategies for development must include a full range of political, institutional and economic policies such as poverty reduction, population dynamics, trade, pricing reform, etc.<sup>6</sup>

Both the UNDP and the UNEP have made far reaching suggestions for the handling of these strategies at the national level. The UNDP programme is called *Capacity 21*.

It underlines that national capacity must be able to handle many issues from policy making through planning and implementation or enforcement. A country should have the capability to participate in global environmental debates and priority setting.

Essential requirements according to *Capacity 21* are: adoption of development strategies that treat environment and development as inseparable; the institution of appropriate policy, legal, regulatory and institutional frameworks; choosing appropriate technology and developing mechanisms for popular participation.<sup>7</sup>

UNEP has recently put forward a suggestion that includes a major list of environmental elements of capacity development.<sup>8</sup> The elements are:

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<sup>5</sup> UNDO/UNDP. *Capacity Building for Sustainable Natural Resources Management. Paper for the First Plenary Meeting of the INC-D*, Nairobi Kenya 24 May - 4 June, 1993.

<sup>6</sup> OECD 1992

<sup>7</sup> UNDP. *Capacity 21. A Programme in support of Agenda 21*. New York: UNDP 1993.

<sup>8</sup> UNEP. *UNEP Paper on Environmental Capacity Building for Sustainable Development*. Nairobi: UNEP March, 1993 (William H Mansfield).

(a) An information and assessment function (which includes training).

(b) An environmental management function that includes government commitment, a national environmental policy, national environmental institutions, environmental laws and regulations, enforcement capability as well as a set of tools for environmental management. The tool box should contain capacity to produce environmental profiles or state of the environment reports, environmental guidelines, environmental impact assessment, cost benefit analysis, environmental accounting procedures, and environmental indicators.

(c) Supporting measures, such as sectorial human resource development (which means training at different levels in different disciplines or trades), environmental education, public information and involvement, technology transfer and technical information. The availability of financial means for doing all this is essential.

Management capacity is the priority here and the UNEP interest in research and research training is not altogether clear. However, it is recommended in the report that the following fields should be considered:

pollution, including climate; inland water resources; marine environment; land resources, including soil, pesticides and chemicals; forest management; biological diversity; wildlife and fisheries management; ecosystem restoration, solid and hazardous waste management; health; human settlements; environmental law; development of sectorial environmental plans (NEAPs, forestry plans, etc.) and training and education.

There is little appreciation for the fact that handling the environment is also a social and political issue which is as important as the technical aspects.

Other ways of looking at this issue therefore must involve a systemic approach and stress on a normative framework within which vision, values, policies and strategies are articulated. **It may be that the real constraints in capacity development are to be found in the field of societal values rather than among technical issues.**

This formidable list of societal and research functions as well as a close reading of other sections of *Agenda 21* outline total capacity requirements which are far beyond the human, financial, and institutional resources of most developing countries. The United Nations Sahelian Office (UNSO) has pointed out that " the data gathering and reporting requirements of all programme areas in all Agenda 21 chapters would test the capacity of many developed countries."

It is unclear what anyone can do to even begin assisting in capacity-building for all these functions. Clearly, it is going to be a long story. By necessity the process must also involve some very sharp choices at the national level between competing priorities in terms

of urgencies and available resources. There is a great risk that the development of a national environmental research capacity will not be at the top of the list.

#### Box 2.

#### Support for environmental administrations

The concept that there must be a functioning (government) institution with which to work and collaborate in order that projects may have a modicum of success, has produced a variety of cooperation projects for capacity development. Thus, according to the Kreditanstalt für Wiederaufbau (KfW), institutional and capacity development from scratch must come before financial assistance.

For the same reason Danida is assisting in setting up an environmental secretariat for the Government of Bhutan, and assisting the Pollution Control Board in Tamil Nadu. It is also working with capacity development support for the Egyptian Environmental Board in collaboration with the Danish environmental administration. ODA supports the Nigerian Federal Environmental Protection Agency, CIDA has a similar project with Indonesian authorities, the Netherlands is involved in creating an Environmental Protection Council in Yemen. Training is an integral part of these arrangements. Interdisciplinary postgraduate special courses, where scientists get a dose of policy making and policy makers are given a chance to look at the scientific problems involved has been on the GTZ agenda for some time. In Florianopolis, GTZ brought the environmental administration into upgrading and further training, built a laboratory jointly used by the administration and the university to bring university and reality together. Local environmental institutions and NGOs are supported in the same way. Examples include the solid waste management project of the GTZ in the Katmandu Valley, Nepal; projects on self-management of water resources by small farmers in Karnataka, India, supported by the Swiss Development Cooperation and the ODA supported Hyderabad Slum Improvement Project. The ODA Hindustani Zink Ltd project and the some environmental protection projects of the GTZ deal with a third and very difficult sector: the support for the creation of institutions for industrial environmental consultancies.<sup>9</sup> The Rockefeller LEAD programme should also be mentioned in this context. The programme currently operates in half a dozen countries. The important issue here is the notion of on-the-job training for mid-career professionals in a range of disciplines through a two-year training and networking programme.<sup>10</sup>

<sup>9</sup> Bruckmeier, K. and B. Glaser. *Institutional Development in Environment, Analysis and Recommendations*. Berlin: Wissenschaftszentrum Berlin für Sozialforschung for the GTZ, 1992.

<sup>10</sup> A key question with respect to projects of the type outlined above is whether they are in fact doing what they purport to do i.e. strengthening capacity or are more simply delivering technologies and information with the actual management of the activity resting with the executing agents. Maybe such projects should be evaluated in terms of congruence between goals and methods and whether local managers and systems actually have opportunities to act on the inputs of new ideas, knowledge and technologies and to make their own decisions. To own the innovations is important as a way of strengthening capacities to analyze, solve problems and act on environment in difficult social and economic contexts.

Anne Bernard, personal communication, in comments on an earlier draft of this paper.



## 2. Fundamental issues of research capacity development

Countries need a quick start on Agenda 21, and they need to train many people at many different levels. One question is how they shall they succeed in doing this. The key question in this context is "which are the main constraints in research capacity development for sustainable development?" An analysis of such constraints must take place at national and regional levels as they are site-specific and may vary from place to place. Once this question is well addressed it is possible to focus on

- (a) "what research capacities are important?" and
  - (b) "what is the best way to build them so that the needs of the country/region in question are filled?".
- When these issues are opened up the redirection of capabilities to different levels of society can be addressed. It may be that this approach is again stressing the "deficits", and looking only at gaps and constraints. But this is a necessary analysis. When such deficit areas are identified there is a time for discussions between donors and national administrations to identify the existing capacities in their systems and how marginal or additional resources might help to catalyze action and provide the "margin" necessary for the further development of existing capacities.<sup>11</sup>

First, four issues may be briefly mentioned: some very general constraint problems, site specificity of problems, various levels of research capacity, and lack of information on research environments.

- **Constraints imposed by "both sides"**

Constraints are imposed from "both sides" in the collaboration equation. The 1992 OECD report points out that there are a number of serious coherence problems in the area of science:

- (a) Developing countries have tended to inhibit research technology transfer for a variety of reasons such as inadequate knowledge of or inability to assess new technologies, "climatic" bias, "this is what we have always done", bad advice or the mere fact that established technology tends to persist in the face of new technology.<sup>12</sup>

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<sup>11</sup> Anne Bernard, in comments on earlier draft of this paper.

<sup>12</sup> OECD 1992, p. 41. A DAC meeting in 1990 produced a set of orientations designated to encourage developing countries to develop national science and technologies linked to economic problems and goals.

(b) Donors have tended to generate unco-ordinated, supply driven research and development technologies in the developing countries while failing to help build commensurate human and institutional capacities to manage technologies. Concentration on the government sector has left out both the private sector and local community needs. Internal constraints to capacity development, that can be found in many places include the crisis in the public sector machinery, with poor pay and low morale of civil servants and university teachers.<sup>13</sup>

- **Site-specific constraints**

Constraints on capacity development in recipient countries depend very much on the country or region in question. Research capacity development is a different and more difficult issue in Africa than in Latin America or India. Site-specific constraints are, however, a big issue and it is obviously impossible to tackle them in a meaningful way in the present context.

- **Emphasis on university support constrains the exploring of alternative recipients.**

As has been said several times in this paper, research development assistance is to a great extent geared towards universities. There are several very good reasons to look for additional/alternative recipients, but the one-sided support for universities has prevented the search for such alternative research institutions. Most officers in the institutions we have interviewed preferred to discuss research competence in terms of priority areas rather than in terms of institutions. Development of research capacity at different levels and in interdisciplinary settings seems to be more important to them than support for universities.

It is not quite clear whether this is an idea that has much support in developing countries (see below for exceptions) There is a paradox here: while support is given to universities and many of the donors have thus begun thinking about other types of institutions, most developing countries are still much attached to the support-for-universities policy. This is probably a problem that can be solved by finding better ways of negotiating. It may be helpful to look at how different forms of research capacity can be thought of in the same terms as research along three different dimensions:

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<sup>13</sup> Berg, E. *Rethinking Technical Cooperation. Reforms for Capacity Building in Africa*. New York: UNDP, Regional Bureau for Africa 1993.

(a) University based research capacity. Basic competence in institutions of higher education, which produce candidates who understand what goes on in international production of knowledge and know how to use that understanding in their professional life. This is may be easiest to see in the natural sciences. "Competence" includes the infrastructure such as libraries and laboratories. This type of support has been on SAREC's agenda for quite some time.

(b) Government-based research capacity. Competence in tackling specific needs for new knowledge which emanate from the special situation of the country. Such a competence may stretch all the way from basic research in the natural sciences or medicine to researching very local or applied fields in, for example, agriculture and education.

(c) Institution - or community-based research capacity. Competence in occasional pockets of excellence at various levels in society which may have been created because of the meeting at a crucial point in time of the special problems with the individuals having the knowledge and intelligence to solve them. This may be accidental but also the result of a deliberate policy choice. This category may also include community-based research capacity.

Within these three broad categories of research activities there is certainly room for a variety of research oriented organizations to be considered for support.

#### • Information needs

There is clearly a need for better information on research environments in recipient regions: priorities, allocation of governments, differing strengths of institutions, etc. Also, in considering how gaps in in-country capacity are best addressed, it is probably necessary to go beyond "environmental research" to "sustainable development research."

#### Box 3..

##### **Are student numbers a reason for university expansion in developing countries?**

What numbers of students are we talking about here? It is difficult to estimate the cost/effectiveness of these operations. One to two per cent of the age group in Africa reach university and only a small fraction of those continue their studies in some research direction. The corresponding figures are three to five per cent for Asia and ten to twenty per cent for Latin America. In Europe some 1,700 per million are professionals with higher education. The comparable figure for Africa is fifty.

Is this a case for increased university expansion? Maybe not. Long term financial health in the local economy is a must for such an expansion but not always available. Changes in curricula and the direction of some higher education funds towards other sectors of society might be an answer: see below. Some donors (GTZ, BMZ) prefer to increase efficiency and increase the possibilities for multiplication effects by support to measures for better university management rather than quantitative increases. Rapid (and often government-mandated) increases in numbers of undergraduates are felt to be undermining the capacity of universities. It may also be useful to think about our own university development in the North and while the increase in resources and capacity has certainly made us understand the environment better it is a moot question whether we are better managers of the environment.

Nevertheless, the need for professionals and qualified labour is rapidly increasing - in some sectors. In other sectors qualified graduates do not find work. It is interesting to see that the production of lawyers, political scientists and art and literature deconstructionists widely surpasses graduates in technology and science. One reason is a school system weak on science education.

## **2.1. Policy and constraint problems: universities**

As we have said above, most donor-supported collaboration in research capacity development is geared to the universities and higher education. Universities are of course necessary, they can do certain things well and they are relevant for development. Their three areas of specialization in the developing country context could be thought of as: (a) training of government administrators and other carriers the development process, and training of teachers for the whole school system; (b) research and development of new knowledge and of methods for selection and further development of technologies; and (c) use of research results for development through advising and consultancy work. But they work in a constantly changing society and there are many trends that work against the use of the university capacity.

### **•2. 1.1 Anti-research trends and constraints**

The funds for research are controlled by governments and industry which usually decide on prioritizing certain areas and on what kind of research should be pursued. But from the point of view of research and the development of research capacity government policies have generally been vacillating. Science and technology are not really thought of as an essential part of an environment development programme or plan.

It is possible to see two trends:

- First, research is irrelevant**

Research done in universities is considered irrelevant; indeed the word "academic" has been turned into an invective. The siting of universities on a hill outside the city centre away from the nasty real world (Dar es Salaam, Tanzania, Legon outside Accra in Ghana, Makerere in Kampala, Uganda, Ibadan in Nigeria etc.) has invited accusations of ivory tower universities. Research has become marginalized, it is considered to be moving too slowly, it is believed to be too reflective. When a country is in an economic crisis "we need

fast decisions and have no time to wait for research results". (This is also echoed in the text of the Rio Declaration, item 15). An anti-research sentiment is created in the minds of public authorities. A western-type university in an "egalitarian" society may also be conceived as an elitist and unpatriotic institution, especially if researchers and students in their analysis criticize government, which has happened several times in, for example, in Tanzania and Kenya. The answer from the authorities has then been to close the university.

#### •Second, the instrumentalist view of research

Research must serve a particular political end.<sup>14</sup> Independent and basic research has been marginalized and this has led to degradation of the role of research and reduced the role of academics into serving short range, narrow objectives. Many developing country governments as well as donors and international organizations are preoccupied with the short term considerations almost to the exclusion of everything else.<sup>15</sup> This short term focus contrasts with the needs of basic research, which are long-term in perspective and take considerable time to build up.<sup>16</sup> It may be useful to keep in mind that really important breakthroughs are often based on basic research and do not come from applied research.

#### 2.1.2. Donor driven vs. recipient driven capacity development

What are the reasons for this state of affairs? Some are ideological or political.<sup>17</sup> There are of course financial difficulties. In a situation where the life of the citizens is in danger be-

<sup>14</sup> Cf. also Court, D. "Scholarship and Contract Research: The Ecology of Social Science in Kenya and Tanzania," in L. Stiefel et. al (eds.) *Social Sciences and Public Policy in the Developing World*, Toronto: Lexington Books 1982 and Mkandawire, T. "Problems and Prospects of Social Sciences in Africa." Paper presented at the Third OSSREA Congress, Kampala May 7 - 11, 1990.

<sup>15</sup> Interesting discussions on this topic can be found in *Seminar on the External Support to Development Research. The Case of sub-Saharan Africa*. 28 - 30 May 1990 Hotel Ngor, Dakar. Ottawa: IDRC MR 265e 1990; Lewis, John P. *Aide extérieure à la recherche pour le développement*, Ottawa: IDRC MR 160f.

<sup>16</sup> See IDRC. *Seminar on External Support to Developmental Research. The Case of sub-Saharan Africa*. Dakar: IDRC 1990.

<sup>17</sup> The disregard for science and research in general has created a variety of practical infrastructure problems; indeed, functioning research infrastructure is non-existent in many countries. Even institutions which should have research & development in science & technology at the top of their agenda are unable to maintain what has been established. Bureaucratic over-establishment in conjunction with financial difficulties has contributed to the deterioration of research institutions.

The list of problems is extensive: lack of hard currency makes it almost impossible to replace instruments and equipment. Electricity and water interruptions in laboratories, worn out and outmoded instrumentation, as well as major transport and communication snafus, cause major problems for field research. Computers exist but are underutilized because of lack of qualified manpower and paper.

cause of drought, war, or hunger it is understandable if government funds are used for things other than research. But many countries have few such problems.

- **Donors must accept some of the blame for these types of constraints**

Capacity development should be recipient driven, but it is not. Donors have developed policies which stress the practical applicability of research results and a shorter way to application. They also chose the key entry points, actions and methods. Many years of donor influence and **donor imposed research projects** and ideas have made the research community inclined to listen very carefully to donors and has shown a great adaptability to suggestions, especially if there was a four-wheel drive in the offering. The concerns have been expressed about the degree to which initiatives like the African Capacity Building Initiative (see box) creates a donor-driven research pull. There may be a danger that collaborative efforts will be less, rather than more, responsive to recipient interests. In the need to satisfy the interests of a multiplicity of donors, it is more likely that the needs of the recipient will have less influence.

- **Friction between donors and recipients.**

Over the years we have observed an increasing but hidden friction between donors and recipients in the research field. The increasing density of donors' activities, the rise of volume and number of projects, and the fact that most governments have no appropriate coordination system has caused friction. Donors are also therefore moving their efforts higher up in the government hierarchies to political and institutional levels not touched before. There have been many cases of choice of wrong or unsuitable expatriate technology, and wrong technical advice - on technology as well as on social policies. In many cases. A tendency to entice away or "steal" the best researchers for a special project may have an impact on management and research development in the thus deprived institution. The Danish Seed Project in Tanzania tried to defoliate the rather weak Forestry Service by demanding the participation of certain researchers as a condition for continued funding. The enormous amounts of external funds going into the very important HIV research in East Africa has in many cases left research on other equally important issues without the necessary manpower.

**Box 4 .****Donor-driven demand for capacity development**

The African Capacity Building Foundation (ACBF) is a collaborative effort with the World Bank as the lead agency, and focuses on capacity development for macro-economic or macro-policy management. (Though there is no particular sector focus as yet, it is possible that environment would be one of the sectors addressed.) One problem with this initiative is that it has created donor-driven demand for particular kinds of capacity-development. This is a common problem in donor-funded research and capacity-development. Researchers in developing countries might choose to focus on quite different problems or issues, or take a different approach, but they will probably of necessity tailor their subject matter to the availability of funds.

To take an example: the African Economic Research Consortium (AERC) has been very successful in putting decision-making about projects and priorities into the hands of national researchers. However, such researchers may already have been molded to some kind of Western views during their academic training and some interviewees maintained that AERC is caught in this situation. Moreover there has been some criticism that the research is not sufficiently aimed at the policy needs of the countries included. Similarly, the World Bank's National Environmental Assessments Initiative is supply driven, not demand driven. All of this adds up to a form of "brain drain", even if researchers remain physically within their country or region.

Similarly, the World Bank's National Environmental Assessments Initiative is supply driven, not demand driven. All of this adds up to a form of "brain drain", even if researchers remain physically within their country or region.

**• "Protect-your-investment"**

There is a type of "protect-your-investment" attitude among donors. Heavy external input into research and research institutions often leads to a situation which is common also in development cooperation: the isolation of projects from the government or the authorities of the country. Many research projects have turned into little islands populated by external scientists and some local researchers. This may speed up the project but will contribute to the detriment of the general research situation and a low rate of localization of research skills.

**• Fads and fashions of development**

Over time we can observe an array of fads and fashions in development research, often in connection with the passing of fads and fashions in development assistance.<sup>18</sup> The prestige given to some sectors or specialties is a similar problem. Some research topics and research areas are not considered very interesting or rewarding in terms of academic kudos.

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<sup>18</sup> Such as early 1950's community development, "take-off" economics, integrated rural development, development from below or trickling down from above, small/big is beautiful, the green revolution, basic needs, a new economic order, decades on this or that, sustainable development, community involvement again. There is certainly more to come.

Public health is of less interest than more dramatic curative medical research, research on nutrition less interesting than HIV research.

- **Research as a throw-away system**

Operation and maintenance capacity is low which is probably a result of years of unending donor support. This support has contributed to the general attitude that the research system is a throw-away system. Receive it today and forget about maintenance and repair, there will always be a donor with a new machine or Landrover at hand. Donors provide funding for vehicles and infrastructure but almost never for recurrent costs. The Government politely ignores the recurrent cost aspect of donor aid (which is included in all agreements as being a recipient government obligation!) just as the donors do. The system is sometimes so large, for example in the agricultural sector, that it decays while new donor programs add to the government's recurrent cost burden. No research plan or rehabilitation plan can be carried out unless these problems are properly addressed.

## **2.2. Policy and constraint problems: local level research support**

The constraining factor in this context is the general disregard for the whole research sector. Because there has been a focus on centres of research excellence, the interest has tended to be on technologies to increase production.

Capacity development, whether for environmental research or anything else, has, however, several faces. It is critically important to consider the political and economic environment, and the question of what the priorities are. There is a tendency to look at capacity-development for research solely in terms of organizations, thereby ignoring the "non-organizational" institutions that exist, for example, the marketplace of local environmental consultants (from peasants to university graduates) and of environmental NGOs.

This raises the awkward questions: "Is the approach we are taking the best for LDCs in addressing their own indigenous problems?" and "Are we supporting the right institutions and are the universities the right place for support?" The situation is not peculiar, it follows the time honoured tradition of development assistance to encourage the development of capability directed towards approaches and subjects familiar to the North.

The kind of capacity that is most useful in terms of solutions for in-country problems may not be the kind that donors traditionally fund nor is it to be found in the classical university



context nor in academically formal and sophisticated research. There has not been an adequate consideration of indigenous "grass-roots" research. Under what conditions is it appropriate to provide funding for research to groups at the local level? It depends very much on the kind of research. Clearly, it would not be a useful approach for high-tech, sophisticated research. But it could work well for adaptive research that is oriented to meeting local needs. It must of course be said that several donor organizations (i.a. SAREC) support research oriented NGOs, such as The Zimbabwe Environmental Research Organization (ZERO), and that donors do consult with NGOs and organize workshops with them in order to make research projects less donor driven (GTZ, SIDA, ODA).

There are very interesting things occurring at the grassroots level, such as experiments on crops done by farmers, primary health care monitoring and health statistics done by village health assistants, and new pedagogical experiments by primary school teachers. At this level there are immediate problems to be solved by those who know where it hurts.

Is there a lack of research capacity at the local level? J. Karekezi has discussed this issue and says: "One of the myths that drive the capacity building debate is that there exists a large and unbridgeable gap in local expertise for undertaking the requisite level of policy analysis and formulation. While it is true that in certain specialized niches, local expertise is inadequate, there is often a significant number of highly skilled local experts who are grossly under-utilized." <sup>19</sup>

"[There is a] belief that sophisticated data collection and analysis tools are required to reach satisfactory policy decisions. The experience in many developing countries appears to indicate that the increased technical sophistication of policy analysis has not resulted in more coherent policy making. The policy analysis and recommendations are largely divorced from policy implementation, which is often erratic and poorly informed." (Karekezi, in progress). Others have maintained that there is a lack of competence to handle environmental issues. (See quote at the beginning of text). There maybe a confusion here between local capacity to handle global issues and capacity to handle local issues. Much of the financing goes to increase the global issue competence.

However, there is a major danger in taking resources available away from local capacity which may destroy the opportunity to integrate the centre and the periphery. Universities are not always very "local" and it is important, for example, to have an insight in local

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<sup>19</sup> J. Karekezi in interview with Rebecca Aird.

models for the exploitation of natural resources and not only to rely on some government or national environmental policy. As mentioned above, there are a variety of research or "studies" oriented NGOs which are much more suited to this type of work and which need support and which deal with policy questions that researchers and disciplines do not touch.

There is, however, clearly a relationship between where an idea originates, and how much funding gets committed to it. Funds get committed to the extent that the idea excites donors, not recipients. Therefore, new initiatives are interesting such as the Ford foundation initiative to move decision making down to an appropriate level by funding local NGOs so that they can define their own research needs and control the research process.

One major constraint in the past has been that we have not know how to handle that cooperation. Even if UNEP and UNDP documents still today abound in non-committal phrases like "furthering community involvement," we are only slowly seeing the end of tarmac sociology ("don't go further away than that you can see the car") and rural development tourism in the name of research. We are finding ways to recognize the roles of local peoples in the development process

Some progress as has been pointed out by C. Toulmin and by Robert Chambers: we have seen decentralization of power, and the recognition of weaknesses of local level institutions. There have been new types of projects with more open goals, more flexible implementation, targets and timing decided by villagers, participatory monitoring and evaluation improved versions of local technologies, and with a highly committed project staff and a high degrees of continuity.<sup>20</sup> We have also lately seen new measures for incorporating knowledge from farmers into conventional research systems as well as new efforts in networking to overcome problems of lack of researchers and scientists. All these facts point to a slowly increasing competence in local level research.<sup>21</sup>

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<sup>20</sup> Toulmin, C. *Gestion de Territoir: Principes, First Lessons and Implications for Action*. UNSO Discussion Paper. Ouagadougou: UNSO March 1993. Chambers, R. *Challenging the Professions*. London: IT Publications 1993.

<sup>21</sup> Warren, D. M. *Using Indigenous Knowledge in Agricultural Development*. World Bank Discussion Paper 127. Washington: The World Bank 1991.

### **3. Approaches to research capacity development**

Research should never be divorced from capacity development, although capacity development is obviously not always tied to research. The intimate relationship between these two factors make a clear division somewhat difficult.

#### **3. 1. University education and training**

Many countries achieved national independence in the late 1950's or early 1960's. There was a tremendous lack of academically trained professionals in almost all disciplines in the developing world. This was especially the case in Africa, where countries at independence could count a handful university professors, medical doctors and other professionals. In this situation in the early sixties the bilateral donors, the World Bank, UNESCO and some of the big foundations embarked on ambitious plans for university and research development. Throughout much of the developing world universities were modeling their higher education and research on western ideas, relying heavily on expatriate personnel and giving degrees that in one way or another were related to a European university which guaranteed the quality of the output. This fact determined the curriculum which was often totally irrelevant to local conditions. (Even in universities in Latin America and in India the Euro-centered curriculum was apparent, although they had a much longer history and more local personnel.) The long-term goal was, of course, to upgrade the local universities, to help build up a local research training programme so that teaching could be done and degrees could be conferred at the home university.

- **Training overseas**

In the meantime training overseas in European or North American universities was the first option. Many of the presently active senior researchers in developing countries have their PhDs and indeed their undergraduate degrees from universities in the North.

But research training is a long term affair and the early experience of undergraduate training followed by many years of graduate programmes was not altogether positive. Many stayed in the country where they were trained. For example, only one or two of the 20 Indonesian civil engineering students that were brought to Sweden in the 1951/52 returned to home. This was a problem especially in countries where the language used for training and teaching was not English or French or Spanish. In countries where these languages

were not the languages of instruction, the academic study had to be preceded by a year (at least) of language training in Russian, Chinese, German or Swedish.

Much of the content of the courses of those early experiments were eminently unsuitable. Training was discipline specific and usually did not involve practical instruction in applied research methods and techniques. The Russians churned out hundreds of MAs in International Law of dubious value from Moscow, Kiev and other schools. Equally problematic was the "climatic bias" of the content of the curriculum in other schools in the North. Water engineering and hydrology was based on models of European climate and rainfall patterns, agricultural training took its lead from North American machine and fertilizer intensive land-use, and much medical training was geared towards highly specialized curative medicine.

Research training in the North is still an important part of development cooperation in this field. But it has changed quite extensively. Today there are other methods than to bring someone to Europe for five to ten years.

#### **Box 5.**

##### **Modalities of support for research training**

**Research School in Environmental Sciences for LDCs** An international initiative has recently been launched by the Netherlands to create a research training facility for environmental science especially geared to the needs of developing countries. A recent meeting with representatives from Austria, Belgium, France, Netherlands, and the UK discussed the financing and the content of the proposed institution which will collaborate with some ten centres in the developing world. The initiative comes from the International Institute for Infrastructural, Hydraulic and Environmental Engineering (IHE) at Delft which is one of the five Dutch Institutes for International Education. This is in line with a recent policy to establish "research schools" or post graduate training facilities at several universities. These schools are part of the Dutch research and university organization but the topics studied are pertinent to developing country graduate students.

**The SAREC Model.** SAREC has had a threefold capacity support programme through (a) national research councils, (b) through universities and ministries and (c) directly through individual institutions. (This three-pronged approach has also been suggested by Dr. J. van Dam, of the Netherlands Ministry of Education and Science in a seminal paper). SAREC's cooperation in capacity development is organized along two lines depending on the capacity of the receiver: (a) In countries with a weak science and technology capacity the main thrust is to build up and strengthen national research capacity through "capacity-emphasizing" institutional cooperation. This can be done directly through the three channels mentioned above or via some kind of twinning arrangement with a Swedish university. It is SAREC's policy not to provide individual scholarships but rather to offer assistance to institutions to develop programmes of research training. (b) In countries with relatively strong science and technology capacity the main aim is to generate research results of importance to the country as well as to other developing countries. Here SAREC supports research cooperation only in areas where Sweden has an advanced expertise to offer. The support within this scheme is quite restrictive.<sup>22</sup>

<sup>22</sup> Bhagavan M.R. *The SAREC Model: Institutional Cooperation and the Strengthening of National Research Capacity in Developing Countries*. SAREC Report. Stockholm: SAREC 1992.

- **Twinning arrangements between universities**

Many universities in the North now have twinning arrangements with universities in the South. Such arrangements, often officially concluded between universities, include research training at different levels, most often in projects. This approach straddles the ground between training of individuals and institutional development.

Twinning collaboration includes one or more of the following arrangements:

Technical and financial support projects; technical assistance using professors from the North for shorter or longer stays in areas not covered by local capacity; research projects; support programmes for libraries, books, laboratory equipment, laboratory material, and a vast array of stipends and scholarships.

- **Third country training**

Third country training should be mentioned here as a special case of normal twinning arrangements, where the appropriate facilities for research training may be found elsewhere than in the twinning institutions. Thus, to avoid the language problem several of the Scandinavian donors early on began to provide students with opportunities for study in a third country. Most countries are also spending large sums on this type of collaboration in capacity development.

- **The sandwich model**

One popular model for research training inside or outside twinning arrangements is the sandwich model, devised to solve the problem of long stays in the North. Here the student comes to the foreign university for an introductory period, goes back home to do his or her field work, and then comes back again at intervals to the foreign university to receive direction and tutoring and to use libraries and computer facilities. The degree is most often conferred by the home university (which incidentally solves the problem of different types of university entrance requirements, and various degree requirements. As projects most often include researchers from the university in the North, much training can also be carried out on site.

**Box 6.****Addis Ababa School of Graduate Studies.**

The programme aims at strengthening national research capacity through dissertation research for MSc and PhD degrees. The MSc programme is carried out entirely in Addis Abeba under the supervision of university staff in the disciplines biology, chemistry, physics, electrical engineering, civil engineering and geography. Approximately 500 MSc dissertations have been given SAREC support since the start in 1979/80, and during 1992/93 - 1993/94 a total of 66 dissertations are expected to be defended. The SAREC support to the MSc programme during this period amounts to SEK 1,0m (approx. \$US 130,000:00). The PhD programme began receiving SAREC support in 1987/88. The programme consists of collaborative programmes with both Swedish and Ethiopian supervision in biology and chemistry. The PhD degrees are conferred by Addis Abeba University. At present five students are enrolled in the programme in microbiology, cytogenetics and analytical chemistry. The first thesis is expected to be defended during the autumn of 1993. During the 1993/94 academic year four new admissions in fisheries biology and electrochemistry are planned. The SAREC support for the PhD programme during 1992/93 - 1993/94 amounts to SEK 2,8m (approx. \$US 300,000:00.)

- **The short-advanced-courses model**

This is a type of collaboration that is suitable for collaboration between institutions already having a certain level of research capacity. It does not envisage MA or PhD. training but is aimed at giving active researchers a state-of-the-art training that can be offered in specialized fields. This type of collaboration is offered by many countries. It would certainly serve a good purpose if it was possible to finance long-term secondments for junior researchers with the international scientific programmes such as the World Climate Research Programme or with new institutes such as Rockefeller's Leadership for Environment and Development Institute (LEAD) in New York.

- **How to write project applications.**

Courses could also include training in producing applications for environmental research project funding. Because of its interdisciplinary nature environmental research puts very special demands on those who apply for research funding. Not only must such applications contain the usual material for the assessment of the committee, but often such applications have to be developed differently or concern little researched border areas and thus more explanation is needed for monodisciplinary committee members. The major problem (which is only addressed to some extent by SAREC, IDRC and WHO/TDR) is how to improve the quality of writing environmental research project proposals. The obvious incompetence or maybe lack of experience is not only individual but exists in institutions as well.

The capacity for finding money, going after it and then managing it well is a major topic for training which is absolutely necessary for environmental research.

### **3.2. Problems with twinning arrangements and university cooperation**

There are many benefits to be won from twinning arrangements. However, some examples of problems of such relationships may be in order.

- **Infrastructure problems**

When training in the North students get used to equipment which is not available at the home university. Much recent training has therefore concentrated on making use of what exists, within the financial means available. The International Foundation for Science usually equips returning researchers with some kind of basic equipment. An imaginative Dutch initiative has been to send equipment and project-related goods in containers that can later be changed into field laboratories. Initial support for infrastructure may also lead to larger collaborative programmes and mutual assistance in research policy development.

Another infrastructural problem which has been approached by SAREC and some other donors is the major problem of library and literature support for environmental research. The newest fashions in electronic support depend on the capacity of telephone lines, regular electricity supply, and financial means to use the rather costly facilities.

- **Senior-junior relationship**

If a university department is entering into a twinning arrangement with a university in the South for the first time it is more than likely that its members have little knowledge of the conditions and constraints under which the research has to be carried out in the country.<sup>23</sup> In such cases the reaction could be a variety of responses which the developing country researchers find overbearing, paternalistic and offensive. If the representatives from the university in the North are senior people who turn up once a year for a couple of weeks, the research collaboration which should be on equal terms may degenerate into a kind of senior-junior partnership.

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<sup>23</sup> Bhagavan, op. cit. Widstrand, C. *Tanzania. Development of Scientific Research and Sarec's support 1977 - 1991*. Stockholm: SAREC 1992.

A systematic effort of information about local conditions would be in place here as well as the use of junior researchers for longer field periods. Meetings of the whole project staff at international meetings is another communication means that has been used with great success in some projects such as regional HIV/AIDS projects in East Africa.

Imaginative solutions, for example to bring a group of students from a Southern university **together with their professor(s)** for an extended first stay in the university in the North have been tried by the Dutch authorities. The extra expense has paid off quite handsomely in many ways.

- **Graduate programmes tied to the North**

Many graduate programmes are tied to the university in the North. An example is the successful cooperation between the Veterinary Faculty of Sokoine University, Tanzania, and the Royal Veterinary and Agricultural University in Copenhagen financed by Danida. Research training in this programme was defined as research training in Denmark. It is not clear whether the Danish institutions were adequately prepared to teach veterinary science researchers for research in tropical conditions. Even if they were, the interesting question here is why the Tanzanians did not demand that training could also be had in a third country. A weak bargaining position or weak bargaining capacity has been offered as an explanation. Local negotiators may have been too cautious to embarrass the two governments, or they were not well informed about alternative training arrangements, or they may have been afraid to loose the whole offer because of hard-nosed bargaining. Senior researchers and technical assistance specialists can be a formidable group to deal with, especially when they "know what is good or bad" for you.<sup>24</sup>

Transparency and balance between junior and senior forces in twinning arrangements and bilateral research programmes are essential. It is also essential that in proposing research programmes and research cooperation with institutions in the North, the initiative lies with the developing country institution.

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<sup>24</sup> Rugumamu, Severine. "Technical Co-operation as an Instrument of Technology Transfer: Some Evidence from Tanzania." *The European Journal of Development Research* 4: 1. June, 1992.



### 3.3. Other types of capacity development

Several of the donor organizations are involved in other forms of capacity-strengthening such as "institution" building, other types of collaborative research projects etc. "Institution" building is a catchword for a variety of activities from building laboratories to providing books and material. The most important part is nevertheless further training and education which has been discussed above.

- **Networking.**

A network is a group of individuals or organizations who exchange information or undertake joint activities, on a voluntary basis. Voluntary is a key word in this context as are the concepts of mutual activities and independence of members.

IDRC and SAREC have for a long time supported such networks, at present probably over one hundred. There are various types of networks: information networks such as the Pastoral Information Network (PINEP) and working networks, such as the Latin American CLACSO and FLASCO. Research networks usually combine the two variations. This has been a very important donor activity, as networks tend to mature and move to a higher level of integration which results in growth in research capacity. Advantages consist of recognizing key research findings which may have been overlooked, economies of scale and transfer of knowledge "vertically" between North and South. Networks can also function as institution "surrogates". One disadvantage is that networks have high human and financial costs for coordination. There is also a risk for non-productive networks to proliferate, and for interference with national research priorities.<sup>25</sup>

## 4. Are these modalities useful for environmental research?

In view of the existing constraints are any of these modalities suited for capacity development in environmental research? Two issues are important here: (a) the difference between capacity for global research and local research and (b) the problem of interdisciplinarity.

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<sup>25</sup> Smutylo, Terry. *Notes on IDRC's Experience with Research Networks*. Ottawa: IDRC 1991; Akhtar, S. "Regional Information Networks: Some Lessons from Latin America." *Information Development* 6:1, 1990.

#### 4.1. Different capacity needs for global and local research

The answer to the question in terms of the first problem must be yes, basic university upgrading and more training facilities *sur place* will of course also benefit environmental research. Most research and model-building and experiments on global environmental issues need a large group of scientists or many groups of scientists with access to expensive equipment. With few exceptions, such research can at present probably only be funded in the North.

However, developing countries need specialists that can follow international discussion on these issues and participate in international meetings. It is important that there is local competence in relating the global issues to the local level problems which after all are the basis for global problems. The gate-keeper function is important here to help select from an ever-increasing science and technology "market". There are also large global problems such as the diminishing of biodiversity, where research needs are indeed site-specific and local (such as local fauna and flora investigations, special local habitats, threats to migrating species in the local environment, etc.) and where local researchers will make important contributions.

#### 4.2. The importance of interdisciplinary approaches

Environmental research is a mixed bag of natural and social sciences. Natural science core disciplines are the biological disciplines such as botany and zoology and their different interdisciplinary variations, as well as the different brands or schools of ecology. These disciplines look after biological aspects of the natural environment. But there is also a need for hydrologists, soil geologists and hydrogeologists, water chemists and a variety of other natural scientists to balance the research equation.

But the environment is also very much a political and economic issue, and the whole field of policy, policy-making, legislation and enforcement, is essential. The historical aspects of long-term effects of chemicals in the environment and long wave environmental changes may be very important.

The integration of aspects of natural sciences into some kind of coherent view is not very easy. It may be even more difficult to integrate points of view from other widely different

disciplines and the combination of social sciences and natural sciences takes some doing. It must also be noted that integration within the social sciences is as difficult as among the natural sciences, economists and anthropologists may be as mutually incomprehensible as chemists and sociologists.

But the fact remains: **"environment" like "development" is not a monodisciplinary issue.**

There is probably wide agreement on this but the problem is that there are so few places that have taken this rather commonplace wisdom ad notam. One university in Sweden, Linköping University, has set up an integrated interdisciplinary PhD programme in water and environmental sciences with full time professors and students from very different disciplines ranging from nuclear chemistry to anthropology via oceanography, hydrology, biology and cultural geography. There are other such schools, for example at the University of Essex at Norwich; several Dutch universities have similar set-ups. But they are few and far between.

Interdisciplinarity is not an easy issue, and is the object of much discussion. But most important is the creation of an intellectual milieu with inputs from various angles, with openness and willingness to learn about methods, approaches or research results from other disciplines. Monodisciplinary institutions usually do not qualify on any of these points and as brownie points in academe come from publishing more minutiae or details of one's own discipline, there is little interest in creating such institutions.

But it is important to stress that a crop specialist or even an ecologist is not an "environmentalist", he or she is a crop specialist or an ecologist, unless surrounded by researchers from other disciplines with an active interest in his or her work and its application.

## 5. Tentative conclusions

It may be of interest finally to again stress some observations made earlier:

- First it has become clear that there is **a great risk that the development of a national environmental research capacity will not be at the top of the national list because of the many difficult priority choices that will have to be made.** This problem

was quite obvious at the Rio conference where developing countries strongly pressed the point that if the North wanted any action on environment they would have to pay for it (besides clearing up their own mess!). The problem for donors in the research field is also obvious: the choice between compelling developing countries to put environment on the top of the agenda or to assist developing countries to set their own agenda and analyze the implications of their environmental policies or lack thereof. In both cases the risk is that the development will be totally donor driven which has to be avoided.

Furthermore:

- **Focus on local needs**

A focus on local needs and local level support is important for any research capacity development cooperation. The immediate problem is to find out what the local needs are and what organizations, other than universities, could possibly be selected by donors in cooperation with national authorities or directly. When thinking in terms of research capacity development at the local level, it is critical that the focus be defined by expressed local needs. This is also a question which intimately concerns the national research system. Capacity development should be recipient driven, but it is not. Donors have developed policies which stress the practical applicability of research results and a shorter way to application. Many years of donor influence and **donor imposed research projects** and ideas have made the research community inclined to listen very carefully to donors and has shown a great adaptability to suggestions. There may be a danger that collaborative efforts will be less, rather than more, responsive to recipient interests.

Donors should take an unprejudiced look at the fact that today's organization of universities and higher education is rather an obstacle to getting close to the major questions in the environmental field at the local level: reductionism is carried very far, there is the monodisciplinary tunnel vision and a tendency to exclude the world in much science research. To put it bluntly: European- North American monodisciplinary style universities are not altogether suitable to take care of or to look after natural resources.

Their contribution may be useful in the disciplinary details, in global climate monitoring, modeling and prediction, but the local problems of, for example, the marine environment, forest exploitation or water management also need other types of research organization closer to reality. It would be worthwhile for donors to discuss what such research organi-

zations should look like and where one can find organizations that have a feel for the important local world views, and that have a built-in capacity to know where the local research priorities are.

- **Building on existing institutions**

Closely connected with the discussion in the previous paragraph is the question of existing institutions. In terms of lessons regarding capacity development in general, the task force that was established to review the achievements of the International Health Policy Program (a collaboratively sponsored program that sought to build research networks and research teams on various dimensions of health policy) found that it was more effective to build on existing institutions than to create new ones, and that the development of these types of capabilities required a long-term commitment, with intensive support in the early years (to build the effort to a "critical" level) with subsequently less intensive, but ongoing, support. The African Capacity Building Foundation used a model that involved the setting up of a new institution with international staffing, and consequent requirements for international levels of funding. It was originally established as a four year pilot project, but is now running into problems of sustainability. ✓

- **Visions and values in the environment**

The value environment in which research capacity development operates is important. Several of the interviewees raised the issue of the necessity to "build a marketplace for ideas," or that the key element is maybe not the institution we support but the cultural and social milieu in which that institution operates.<sup>26</sup> A positive environment can be created in many ways. The intellectual exchange and challenges in university twinning arrangements is one important way. Another way is to do something about local salaries and the financial problems of researchers which are absolutely appalling in many places. This is a thorny issue, and the arguments for and against topping up local salaries are well known. But the issue must be confronted honestly and there must be solutions.

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<sup>26</sup> Cf. also Berg 1993, note 13.

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- **Long-term secondment.**

Finance for long-term secondment of junior scholars to one of the international environmental research organizations would, according to several interviewees, serve a good purpose.

- **Evaluation of research programmes**

There tends to be little evaluation of the impact of capacity development initiatives, especially when these are tied to other types of projects (i.e., not "stand-alone" capacity development). The use of evaluation as a management tool by developing country research institutions has been quite limited. There is a need for development of evaluation capacity.

A key question with respect to projects of the type outlined above is whether they are in fact doing what they purport to do i.e. strengthening capacity or are more simply delivering technologies and information with the actual management of the activity resting with the executing agents. Maybe such projects should be evaluated in terms of congruence between goals and methods and whether local managers and systems actually have opportunities to act on the inputs of new ideas, knowledge and technologies and make their own decisions. To own the innovations is important as a way of strengthening capacities to analyze, solve problems and act on environment in difficult social and economic contexts.