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10. Empowering Connections
Influencing Social Science Knowledge Production in Distant Places

'Science' and 'science capacity building' are gaining greater importance as areas for intervention by international development cooperation agencies in their efforts to reach development and poverty elimination goals, as well as those of environmental conservation. And, while actors in international development hope that strengthened national science capacity will contribute to meeting their goals, experts worry that science in developing countries is in a state of crisis (Gaillard et al. 2005; Ramphele 2004; Task Force for Higher Education and Society 2000). Fragile science infrastructures, low national investment in science education and research, infrequent recruitment of new scientists to research institutions, poor salaries, and losses in scientific capacity due to the Brain Drain are just a few factors that pose challenges for the sustainability of the science and technology communities in many developing countries.

The mission of the International Foundation for Science (IFS) rests on the belief that national scientific research capacity is a prerequisite for countries to achieve their development goals (Ståhl 2004; Ståhl and Hall 2003). In this context, the role of IFS is to support high-quality science and scientists in developing countries. The IFS granting programme is highly regarded for its documented successes. Both internal impact assessments (Russell et al. 2007; Zink and Gaillard 2006; Gaillard and Zink 2003; Gaillard et al. 2002; Gaillard et al. 2001; Gaillard and Furó Tullberg 2001) and external evaluations (Thulstrup et al. 2001) confirm that IFS has had a significant impact on science in developing countries, especially given the modest resources that it has at hand.

The purpose of this paper, however, is neither to evaluate the merits of the IFS programme nor to posit causal links between science capacity and development. Rather, this paper sets out to analyse the relationships of

power that connect a scientific research capacity-building programme and social scientists in developing countries. In particular, I ask if and how an international science capacity-building organisation might influence the production of social science knowledge.

The arguments and conclusions found in this paper result from an analysis of IFS documentation as well as reflections on my own experiences as a member of the IFS staff. Since the year 2000 I have been employed by IFS in several different capacities, one being the original coordinator and primary architect of the programme of support for social science research. In my various roles, I have been able to participate in and contribute to the development of the IFS programme in general, and have been responsible for many aspects of the social sciences granting programme that are analysed in these pages.[1]

Empowering connections

Scientific capacity building is a normative project that seeks to enrol developing country researchers into a mode of knowledge production that can be recognised and understood internationally. It turns researchers into internationally recognisable scientists who can participate in and contribute to what one might collectively call the international field of science (Bourdieu 2004). As individuals, developing country scientists are researchers who can together with others produce scientific facts that are globally understandable, stable and mobile (Latour 2005; Lowe 2004).

In order to build science capacity in developing countries, researchers must voluntarily subscribe to ways of thinking and communicating that are recognised as scientific by other scientists. To subject oneself to scientific capacity building is to enter into the kind of voluntary and coercive relationships that have been described in other situations by Rose (1996), Cruikshank (1999), and Triantafillou and Nielsen (2001). The rewards

[1] I am grateful for both the supportive and critical comments by Sten Hagberg, Charlotta Widmark, participants in the Anthropology and Practice Conference, and many of my colleagues at IFS, including Michael Ståhl, Maria Dutarte, Ingrid Leemans, Richard Hall, and Daniel Hedlund. I would especially like to thank the Scientific Advisory Committee for the Social Sciences at IFS for their dedicated, tireless and voluntary work for IFS, and for the endless learning opportunities that participation in their meetings has afforded to me. I am grateful to Sten Hagberg and Henrik Secher Marcussen for their encouragement and sharing of ideas. I thank the many social scientists who have sent and continue to send their research proposals to IFS and entrusted me to read them. The views and opinions, and not least the mistakes, expressed in this document are my own, and are not necessarily shared by IFS. This paper was prepared in late 2006 for the *Anthropology in Practice* Conference at Uppsala University, and for me it was a welcome opportunity to reflect critically on the work of IFS.

that entice researchers to strengthen their scientific capacity through the successful mastering of modern technologies (both mental and mechanical) of scientific knowledge production are many. They include an expansion of possibilities for building scientific, economic and personal networks, as well as accumulation of symbolic and economic capital. In short, successful capacity building empowers new connections.

This explanation of the powers at work in science capacity building is not meant to be cynical. As easily as coercive relationships can be destructive, a coercive relationship can also be one that is productive and does 'good' (Cruikshank 1999). Similarly, the fact that power is at work in science capacity building, and that persons are motivated by more than only idealist goals to create knowledge for the betterment of humanity, disparages neither the ability of scientific knowledge to convincingly explain the world nor the moral standing of organisations and persons that promote science as a solution to real world problems.

This paper does not seek to judge the moral correctness of scientific capacity building, and from my perspective such a purpose would not make sense. Rather, this paper seeks to understand what kinds of relationships underpin the building of scientific capacity building and the subsequent production of scientific knowledge. In this instance, this is accomplished by using a case study that is also a personal reflection on my involvement with an organisation promoting scientific research capacity in developing countries.

In the following pages I will seek to understand the role of IFS as a thread in the actor-networks of social science knowledge producers in developing countries.[2] The idea of an actor-network is borrowed from Bruno Latour (2005, 1987). If an IFS grantee is a central node in an actor-network that produces scientific knowledge, then the threads of connection to other agents that influence her production are innumerable and of widely varying importance. While individual scientists are key figures in these actor-networks, they do not produce knowledge on their own. Their production is to varying degrees a result of relationships with other scientists through membership in research teams, in institutions, and in academic departments. It is also influenced by the work of students, funding agencies, and bureaucrats, not to mention the availability of scientific equipment, documents that outline national research priorities, and even the objects of research themselves.

[2] Hereinafter I refer to social science knowledge producers simply as knowledge producers, and social science knowledge production as knowledge production.

Given the possibility for expansive actor-networks, the researcher's connection to IFS may be of more or less importance in shaping the form of her knowledge production. IFS staff themselves recognise this, and talk about capacity strengthening rather than capacity building. This is a way of marking that IFS itself is only one agent in a world full of agents. Nevertheless, one can investigate this connection for how IFS might weigh in as a political actor in the production of knowledge, and from this we may glean an idea of how other threads in the network produce influence.

If we are to take Latour seriously, then we cannot talk about IFS as only one strand in the actor-network. In fact, the threads are multiple. The agencies exerted by IFS on a researcher include those of the IFS Board of Trustees, IFS donor organisations, Secretariat staff, and members of the Scientific Advisory Committee who decide the fate of a research proposal. Whether or not one agrees with Latour (2005) regarding the agency of objects (for alternatives to Latour see Traweek 1988; or Bourdieu 2004), we must also recognise that things such as the application form, IFS documents, and the grant money itself play a role in determining the actions of the scientist.

Having established some of the threads that influence scientific knowledge production, it is worthwhile to consider for a moment how these threads exert influence on the production of knowledge. In the case of IFS, for example, how might the capacity-building organisation exert power over the production of knowledge? Can this power be said to be exerted through a relationship that is voluntarily entered into by the developing country researcher, and at the same time has coercive elements that work on the subjectivity of the researcher? These kinds of power relationships have been written extensively about recently (Rose 1996; Cruikshank 1999; Triantafillou and Nielsen 2001; Wahlberg 2007), but not in terms of scientific capacity building. Nevertheless, I believe it is an apt description of the workings of power in this situation, and will in the following pages try to convince the reader of the same.

The building of scientific capacity is a project to convince researchers to see the world and to practice knowledge production in a way that can be recognised, understood, and used in the international arenas of science. Science capacity is the ability of researchers to govern their own production of knowledge, so that it is produced in a form that can be used and accepted by scientists internationally. In the contemporary lingo, capacity building inculcates a scientific subjectivity in the researcher. The power wielded by an organisation such as IFS is what Foucault called bio-power and Cruikshank describes as

> power that promotes rather than represses subjectivity, power that produces and relies upon active subjects rather than absolute subjugation. Instead of excluding participation or repressing subjectivity, bio-power operates to invest the citizen with a set of goals and self understandings, and gives the citizen subject an investment in participating voluntarily in programs, projects, and institutions set up to 'help' them. (Cruikshank 1999: 41)

In this space I have sketched a theoretical framework in which persons become capable of producing knowledge that is recognisable as scientific by accepting a scientific subjectivity that governs their actions and whereby knowledge is produced by actor-networks with the scientist(s) at the centre. Furthermore, the impulse to adopt and cultivate a scientific subjectivity is found in the constellation of relationships in the actor-network. It is with this theoretical framework as a foundation that I organise my reflections on the subjectivity-building work of IFS.

In the following sections, I also pay close attention to the idea of development that is communicated by IFS to researchers participating in 'scientific research capacity strengthening'. Given that the IFS mission is framed within the context of development, and IFS is funded by development cooperation agencies to contribute to the achievement of development goals, it would be strange if ideas about development were not interwoven with ideas about science. Having said this, I must be careful to point out that I do not claim that IFS funds development projects.

I will describe how various actors within IFS conceive of development and science (both together and separately), and the implications this has for how social scientists formulate their research projects. Instead of analysing the importance of science for development, or development for science, I examine the power of ideas about science and development to influence the subjectivities of researchers. In this paper, one can think of development as a marker for the transfer of ideas from IFS to the researcher.

Beginnings to ends: A short history of IFS

In order to account for the agencies exerted by IFS on knowledge production, we must start with the organisation's history. The International Foundation for Science (IFS) was first conceptualised during the Pug-

wash conferences held during the mid and late 1960s.[3] A number of leading scientists, among them physicists Robert Marshak and Abdus Salam (who would later become the 1979 Nobel Laureate in Physics), oceanographer Roger Revelle, and astrophysicist Pierre Auger, were concerned by the perceived threat that the Brain Drain posed to developing countries. In the relatively new science communities in Africa, Asia and Latin America, the best young scientists were leaving their home countries to take up well-paid positions in much better equipped research institutions in Europe and North America.

It was in this context that the idea for IFS was discussed. It was felt that a mechanism was needed that would provide individualised support to young researchers in developing countries to help them to get established as scientists in their home country, while at the same time linking them to the international science community. While science-funding organisations such as Sida-SAREC, IDRC and others recognised that such a mechanism could be important, they felt it would be too difficult and costly for organisations that specialise in funding large programmes to efficiently run a small-grants programme for individuals.

When this idea was later discussed at a meeting of the UN Advisory Committee on Science and Technology, the project gained momentum and Sven Brohult, then President of the Royal Swedish Academy of Engineering Sciences, became its leading promoter. A meeting was convened in 1970 that brought together fifty scientists from twenty countries to discuss the formal structure that a new organisation to support individual young scientists should have. In 1972, IFS was established as a non-governmental organisation with a secretariat in Stockholm, Sweden.

Despite the breadth of the new organisation's name, the scope of its scientific programme was narrow. Two factors were particularly important for identifying the scope of the activities of the new organisation: a desire to use science to support rural development, and the availability of modest resources. Firstly, the scientists should be working in fields that were relevant to development problems and priorities. Specifically, scientists' results should lead to increased food production and improvements in the quality of rural life. Secondly, funding for the fledgling organisation was modest and the research grants it would award would be small. Hence, it was important that the scientific scope of the programme should include fields of science where small grants (at that time a maximum of USD 10,000, but usually much less) would be sufficient for car-

[3] See www.pugwash.org for more information about this Nobel Peace Prize-winning (1995) series of conferences that brings together leading scientists who are concerned to reduce risks of armed conflict.

rying out research projects that could make a meaningful contribution of new knowledge to a scientific field.

Following upon these factors, six research areas were selected for inclusion in the IFS research grants programme. These were aquaculture, animal production, vegetable production, mycorrhiza and afforestation, food fermentation, and natural substances. Thus, already at its origins, IFS defined its scientific programme based upon explicit assumptions about the relationship between scientific research and development.

During the ensuing thirty-five years IFS has gone through a number of changes, but the overall mission and the conceptualisation of the granting programme for young scientists has remained largely the same. As funding has grown, together with the accumulating number of grants to be administered, the Secretariat in Stockholm has also grown in size from a handful of persons to around twenty. The focus of the granting programme has remained on individuals, though in recent years there have been a few forays to support groups of researchers working collaboratively.

Importantly, the fields of eligible research have expanded over the years to include any scientific research that addresses issues relevant for the sustainable management, use, and/or conservation of biological and water resources. Nevertheless, within these parameters projects are eligible only if they are deemed to be relevant for reaching conservation and development goals. In fact, I would suggest that 'relevancy' is the criterion that continues to tie the IFS research agenda closely to ideas of development. Basic physics and chemistry, for example, are generally not considered to be sufficiently related to the human use or management of biological and water resources to merit support.

IFS as an organisation brings together diverse groups of individuals and institutions from both science and development. Scientists gave birth to IFS and have actively guided it through its history. Meanwhile, development aid agencies have been the most important funders of the IFS. This dynamic makes the work of IFS interesting and exciting, both in terms of the research it supports, and the kinds of actor-networks and subjectivities it encourages.

The IFS Granting Programme

Each year IFS receives more than 1,000 research grant applications from young researchers in developing countries around the world. In 2006, the number of applications was closer to 1,500. Historically, IFS has awarded approximately one-third of its grants to researchers in Asia, one-third to researchers in Africa, and one-third to researchers in Latin America. During recent years, closer to 40 per cent of grants have been awarded to Africa with slight decreases in the numbers awarded to Asia and Latin America. The target group for grants is under forty years of age and has at least a master's degree or the equivalent.

Applications for support are reviewed in three stages, first by IFS Secretariat staff, then by independent researchers (IFS Advisers), and finally by a Scientific Advisory Committee. The latter consists of a small group of independent scientists from a range of institutions who meet to discuss the merits and demerits of each application. Normally, a research grant application will have been read and commented on by six to ten senior researchers with experience in the applicant's field. Reviewers are asked to make their recommendations based upon the scientific quality of the proposal, its relevance, and the background of the applicant.[4] Applicants with projects that are recommended for support by the committees are generally funded by IFS, except when there is a shortfall in funding.

Scientific Programme Coordinators[5] at IFS are directly responsible for decisions regarding the grant applications at the first stage (i.e. prescreening). They are not responsible for making decisions regarding the applications at the second and third stage. However, they do have considerable influence to the extent that they choose the reviewers who will review each individual application.

As of late 2007, the IFS research grant had a maximum value of USD 12,000 and could be used to buy equipment and arrange fieldwork for a project lasting between one and three years. The grant cannot be used to cover the costs of grantee salaries, and as a result all grantees must have a

[4] The review instructions to external Advisers (i.e. reviewers not sitting on a Scientific Advisory Committee) were changed in early 2007 to exclude relevance and to focus on scientific quality. However, it is still expected that Scientific Advisory Committees will consider the issue of relevance. As I understood the discussions at the meeting where this discussion took place (a meeting of Secretariat staff and members of various Scientific Advisory Committees), the general consensus is that this change is not meant to result in discounting the importance of relevance, but rather to facilitate the evaluation of relevance and quality separately.

[5] This is my title at IFS. However, as of July 2007 I am no longer responsible for the social sciences research grants programme. I am currently on leave of absence while enrolled in the PhD programme at the Department of Anthropology and Ethnology at Uppsala University.

livelihood from an institution that supports them to carry out research. Usually this is a national research institution or university, but also increasingly it is from NGOs. In addition to the grant, IFS can provide travel support to attend conferences and workshops, as well as scientific mentorship and support in the purchase of scientific equipment. Each year between 200 and 250 research grants are awarded.

IFS and the social sciences

Already in the early 1990s there was discussion about adding social scientists to the group of researchers eligible for IFS grants, and an external evaluation in 1993 urged the Secretariat to consider adding social sciences to the programme. However, when I joined IFS in 2000 this discussion was dead. It was not until 2001 that a new IFS Director revived the discussion, and the suggestion gained momentum within the IFS Secretariat and was brought to the IFS Board of Trustees.

Initially there was some hesitancy within the Board of Trustees about expanding the programme to include social sciences. The reasons for this seemed to vary from person to person, but two general factors, certainly, were that no social scientist sat on the Board, and that there was a concern that opening the programme to the social sciences would result in an overwhelming flood of grant applications that the limited funds available would not be able to absorb. While one or two individuals might have questioned the fundamental value of the social sciences, the general disposition of the Board towards the social sciences was rather positive.

Having sat in on many of the meetings where the issue was debated, I understood that the primary arguments for including the social sciences were twofold. On the one hand, by expanding the programme it might be possible to convince donor agencies to contribute additional funds to IFS, and this would have a positive effect on the entire programme. On the other hand, Board members foresaw that funding social science research would contribute towards the uptake of new technologies for development. It was felt that social scientists were important brokers between the natural scientists whose research led to new technologies, and the populations and markets for those technologies. It was common at the time to hear both Secretariat staff and Board of Trustees members lament that much useful work in the natural sciences remained on the shelves of laboratories and libraries and never saw large-scale use by people in developing countries. The feeling was that perhaps by supporting social science

research, and communication between social scientists and natural scientists, some of these problems could be ameliorated.

The strategy document for what was then called the IFS Social Sciences Initiative was adopted by the Board of Trustees in October 2002. This document, of which I was the primary author among many contributors, was both a strategy for implementing a new granting programme and an argument intended to persuade the Board and IFS Donors to support inclusion of the social sciences. The document incorporated reasons in favour of supporting the social sciences that had already been voiced among Board members and at the Secretariat. These include that the overall goal in supporting social science projects is to strengthen 'capacity for sustainable development in developing countries' (IFS 2002). Furthermore, the strategy document continues, 'IFS recognizes that multidisciplinary research and communication is a key to the production of knowledge leading to creative solutions to problems of sustainable development.' Thus, the formal reasons for including the social sciences in the overall IFS programme were very close to the same reasons used in 1972 to justify the choice of the first eligible research fields, namely the contribution that science could make to development.

The Board of Trustees was initially undecided on the need for the Secretariat to establish a new Scientific Advisory Committee to review research grant applications in social science fields. While some of this uncertainty was probably due to the cost of such a committee, another aspect was the degree to which the social sciences at IFS should be a freestanding research area versus one that was integrated into and in some sense subordinate to the already existing natural science research areas. The existence of a social science committee would result in greater influence by social scientists on the activities and policies of IFS.

After some discussion and debate, a social sciences committee was constituted in 2003 that included anthropologists, geographers, rural sociologists, and economists. Since this time, the social sciences at IFS have enjoyed strong support from Secretariat staff, IFS Donors, and not least the Board of Trustees, and have in fact been seen as a fountain of new ideas and opportunities for the further development of the IFS programme in general.

The establishment of a Scientific Advisory Committee for the social sciences at IFS is of importance for understanding the nature of the social science research that IFS supports. The existence of a committee has allowed the social sciences at IFS to develop beyond the role of broker for the natural sciences. In my experience as observer and organiser of the group, the committee favours projects according to the degree that they

are innovative and go beyond inventorying knowledge, brokering change, or designing management plans. The committee also favours projects by social scientists, as opposed to projects by researchers with training in the natural sciences that would employ social science methods (though these projects also find support when they are deemed to be of high quality).

This section, as well as the previous two sections, has reviewed the history and structure of IFS. This retrospective lifts actors and events to light that directly influence the production of knowledge in developing countries. The members of the IFS Board of Trustees as well as the members of the IFS Scientific Advisory Committee are tied to the production of new social science knowledge through their decisions to provide funding to a particular kind of knowledge production, and through the selection of specific individuals to carry out the work. This is the beginning of our map of actor-networks in the capacity-building project.

In the following sections I will further narrow the focus to capture some specific relationships and technologies in the actor-network that contribute to the creation of scientific subjectivities. These include research grant application forms, Scientific Advisory Committee decisions, and IFS promotional documents. In our analysis we will find that IFS is not a container for a homogenous bundle of actor-network threads, rather we will see that there is some diversity of both means and ends within the bundle.

Mixing signals: The application form

All applications to IFS, regardless of discipline, are made on a common thirteen-page application form that is preceded by six pages of written guidelines and instructions. This form requires researchers to elaborate a specific context of partners in science and development, available and requested equipment, literature citations (case studies and theory), methodological techniques, and institutions that supports their ambition to test a particular hypothesis or answer a research question. The various sections of the form require the applicant to document the scientific, institutional, and infrastructural support for the project. These supports both argue for the possibility of doing the proposed work and chart the influences that enable the researcher to ask her particular research question. In effect, a well-formulated application form maps an actor-network consisting of people, institutions, machines, and documents that promises to produce new scientific knowledge.

In addition to being a physical representation of an actor-network, the application form demands that a researcher organise her ideas and arguments in a particular way. The form itself is a technology that promotes a scientific subjectivity (for a discussion of technologies of governance, see Cruikshank 1999). The more convincingly the researcher can demonstrate her own scientific subjectivity, the more likely it is that a project will be supported. In the IFS application form this is done by constructing scientific hypotheses, a review of scientific literature that supports a research question, a list of scientific partners relevant to the proposed work, a budget and equipment list that links directly to a scientific research methodology, and a plan for analysing data that lends itself to publication of the research results in a scientific forum.

Given that the IFS programme in developing countries is closely associated with development goals, it is not surprising to find this reflected in the application form, where ideas of science are mixed with those of development. The application form is an instrument that encourages researchers to adopt a stance towards their own knowledge production that assimilates particular notions regarding a relationship between the project of science and the project of development.

Evidence for this claim is found in the application form itself as well as in its guidelines for applicants. It encourages researchers to frame their work in terms of 'sustainability', 'development', and 'environment'. Throughout the application guidelines and form (available at www.ifs.se) a message is repeatedly conveyed to the researchers that they must draw some explicit links between the research question and hypotheses that they pose, and the context of development, environment and sustainability. The first sentence of the guidelines demands that proposed research 'be relevant to the renewable utilization of the biological resource base'. In the section on eligibility it is stated that the project 'must be relevant to the needs of the country or region'. In the description of the granting process, applicants are reminded that reviewers will consider the 'relevance of the expected results' of the project. The description of the IFS research areas emphasises that regardless of discipline, projects must be 'important in the conservation, production and renewable utilization of the biological resource base'. In addition, 'applicants should explain the relevance of their proposed research in relation to environmental and socio-economic conditions in the country/region.' Each of these instructions is found on the first page of the guidelines for completing the application form. Later, in the specific guidelines for particular sections of the application form, there are three sections (9.1, 9.7, and 9.11) where the applicant is specifically requested to discuss the proposed research in terms of local stake-

holders, national economic and environmental priorities, local and national socio-economic and environmental conditions.

While the total space allocated in the application form to specifically raise issues of relevance, renewable utilisation, socio-economic conditions and priorities, etc. is limited, the preponderance of references in the guidelines to these issues sends a clear message to applicants that they must frame their work in terms of 'sustainability', 'development', and 'environment'. The interweaving of statements about development and environment with guidelines for eligibility, scientific quality, and evaluation strongly encourages applicants to integrate these concepts into their strategy for carrying out research and producing new scientific knowledge.

My understanding is that the intention of IFS in using this type of discourse is to encourage research projects that can generate new knowledge having a positive impact for human well-being in poor countries. And, in fact, there is substantial evidence that IFS grantees have had significant success in this respect (Schiøler 2002). Nevertheless, among social scientists, another result appears to be that IFS encourages project proposals that reiterate conventional wisdom about relationships between environment, development and science. Rather than reflecting upon and advancing beyond these conventional wisdoms, researchers often request funding to apply them to pre-defined development problems.

Take, for example, the project proposal submitted to IFS entitled 'Decisions in sustainable environment of pastoralists in Western [X]'. This proposal[6] by an agricultural economist in an African country identifies a problem that is conceived in linear evolutionary terms. Increased population pressure and climate variability have led pastoralists to give up nomadic pastoralism in favour of sedentary agricultural production. However, this change in livelihoods is leading to environmental degradation, and ultimately undermining food security. The applicant posits that the solution to the problem is the adoption of an agro-pastoral livelihood. As a result, the objective of the research is to analyse the economic factors influencing the pastoralists to choose a sedentary agricultural livelihood, and to propose a package of policies and incentives to lead them to the alternative livelihood system that will lead to 'more productive, sustainable and poverty-reducing land management'. This project proposed to gather information as a means to achieving a pre-determined development

[6] The research proposals discussed in the paper are real proposals submitted to IFS. To protect the anonymity of the authors of these proposals, they are not named and geographical and other details that might reveal the author are removed.

goal. It is unlikely to achieve a new understanding of development or environmental degradation in this context.

Another example is a project entitled 'Institutional arrangements for improving the contribution of community-based forest management to the livelihood security of the poor in [Y]'. Here, a researcher with a degree in development studies would like to carry out a project to 'identify the key institutional arrangements that will significantly influence the contribution community-based forest management has to improving the livelihood security of the poor'. In this proposal the direct and progressive links between poor people, effective community-based forest management, and poverty alleviation are assumed. The research is intended as an instrument to tweak the institutional arrangements of forestry management, resulting in the development outcome that poverty is eradicated (or at least alleviated). From the perspective of a social scientist, the problem with this kind of research is that terms such as poverty, community and livelihood security are not deconstructed to discover the relationships of power that they conceal. A proposal that did more than reaffirm conventional wisdoms about poverty and forests might instead begin by questioning if there are in fact important links between poverty and forest management, and how those links actually work. This kind of research might lead to new approaches to alleviating poverty, rather than simply reconfirming without testing old assumptions.

In my experience, these examples illustrate the kind of instrumental approaches to doing research that the application form encourages. The research is designed to produce facts and evidence that support a foregone conclusion. Whether the form is actively changing how researchers conceive of their projects, or if it only reaffirms a subjective understanding of the purpose of research already held by the researcher, is an open question that could be further studied through interviews and sampling of IFS applicants.

In sum, the application form offers the opportunity for a young researcher to access a considerable amount of funding. However, in order to do so she must map her network of support. Not only this, the structure of the form encourages her to draw a map that demonstrates that she has internalised a subjective understanding of how scientific knowledge is produced that combines internationally accepted ideas about empirical scientific research, as well as a perspective on this knowledge production that is closely tied to ideas of sustainable development.

The reason for mixing messages about science and development is that the form itself is enmeshed in a complicated network of competing interests and subjectivities. For example, there are bureaucratic and technical

reasons why it is preferable to have one unchanged version of the application form. A single form must be useful to all applicants to IFS, including chemists, veterinarians and cultural anthropologists. It may be that the messages identified here have a different effect in natural science disciplines. In addition, the messages being communicated to applicants about development and science simultaneously result from and are intended for IFS Donors. These are primarily development cooperation agencies.

As we will see in the following section, the subjectivity elicited by the form is not wholly aligned with how scientific quality is conceived in the Scientific Advisory Committee that evaluates proposals.

Picking winners and making losers: The review process

In general, the IFS granting programme is a highly competitive one, and the granting programme for the social sciences is even more so. The number of research grant applications submitted to IFS that are evaluated within the social sciences research area of the IFS programme is between 100 and 150 per year, and most proposals are received from researchers working in Africa. The average rate of success for applicants from the social sciences was 12 per cent for the period of 2002–2006.[7]

The success of a social science application usually depends on the technical strength of the research design. In other words, it depends on the perceived likelihood of the research design to generate data that can be used to answer the research question, test the hypotheses, and reach the stated objectives of the project. Success is also dependent upon the degree to which a project is innovative and likely to create new knowledge that deepens our understanding of the research topic. This perspective is in line with the idea of a scientific subjectivity, but it conflicts with the application form's conflation of science and development.

Most applications that are not successful fail because the research design is technically weak. These projects usually suffer from several of the following characteristics: they do not contain a testable hypothesis; they are not informed by current scientific literature in the field; the proposed methods for carrying out the work are not well described and/or relevant to the research questions posed; the budget of the project is not closely

[7] By way of comparison, for the same time period, the overall rate of success of applications to the IFS programme was 17 per cent (IFS 2006; IFS 2005).

related to the work proposed; the applicant's background and training is not relevant to the proposed work.

Here I would like to provide just a few examples of project titles and the reasoning of the Scientific Advisory Committee in not recommending proposals.[8] 'Information and communication technology usage in research-extension-farmer linkage system for agricultural development' was not supported because key concepts were not defined, 'the research methodology is not well explained', and 'the budget is unacceptable'. The project 'Ethnobotany among the [Z] people' was not supported, despite that the committee felt it was an interesting topic, because recent theoretical and case study literature was not cited and used, 'little information is provided about the [Z] people and their current social, economic, and political situation', and the researcher needed to broaden her network of scientific contacts. Another project, 'The role of women in riparian fisheries productivity', is unsuccessful because while it claims to focus on decision-making processes, 'the formulation of the research problem and objectives is not focused on the decision-making'. Furthermore, 'the hypotheses are not testable' and 'the bibliography review is weak, and the literature on gender studies is missing'.

In these cases, the researcher was not able to closely tie her own proposed research to the norms and standards for quality research in her field. The network of actors, equipment, and scientific literature that the researcher constructs to support her proposed work (Latour 1987) is easily unravelled by the peer review process that IFS uses to evaluate applications. This is the most common reason for failure.

Another reason for failure of applications is that the project that the researcher has assembled is primarily designed for achieving a particular development outcome. These are projects that will reiterate and reconfirm what is already conventional wisdom in the fields of development and environment, but they will not contribute to a better understanding of the underlying social, cultural and economic relationships that explain how and why humans relate to and use their natural resources. Two examples of such projects were discussed earlier in the section on application forms. In both cases, the Scientific Advisory Committee did not recommend supporting the projects and instead provided advice to the researchers on how they might improve the design of their projects.

The application form for an IFS grant clearly articulates that the design of research proposals must be technically strong, and the reviewers evalu-

[8] The quotations that follow are from letters written by me to the applicants, in which I relayed the reasons stated by the Scientific Advisory Committee for not supporting an application.

ate the degree to which the applicant has succeeded in constructing such a proposal. However, the assumptions about relationships between science and development that were made in and elicited by the application form and guidelines are not necessarily shared by the reviewers. These mixed messages may be one reason for the high rate of failure of social science applications in the IFS review committee.

Applications that succeed (see www.ifs.se for a list of titles) are able to map a convincing actor-network that can be mobilised to produce knowledge. Furthermore, the applications are recognisable as evidence of an author who governs her own actions according to the expectations of scientists.

The decision by IFS to grant research money to a researcher is also the point when scientific capacity building becomes a coercive project. By accepting the money, the researcher enters into a contract with IFS that binds her to carry out a project in the manner that is explained by her application form. Withdrawal from this contract is discouraged by including the researcher's supervisor and institution as a signatory to the contract, and also by making public announcements in the scientific community regarding the researcher's new status as IFS grantee. Failure to meet the terms of the agreement gives IFS the right to reclaim the grant money, and also to withhold other forms of capacity-enhancing support.

Brochures and booklets: Technologies of representation

As was mentioned earlier, IFS champions the idea that there are strong links between scientific research capacity and sustainable development. However, like many other well-respected actors in the field of capacity building (Juma and Yee-Cheong 2005; Sagasti 2004; Ramphele 2004), IFS has difficulty making explicit how it understands this relationship to work. A solution to this problem is to use brochures and booklets containing 'grantee stories' that can convince other actors of the link between science and development without resorting to specific causal relationships. I call these texts technologies because their purpose is to work on the subjective understandings of an array of actors within the field of science capacity building.

To make an argument that the IFS programme is important for sustainable development, IFS provides examples of grantees that embody a desirable relationship between science and environmental and develop-

ment goals. These grantee stories are produced for multiple audiences, and they are told and retold through reports, pamphlets, PowerPoint presentations, and word of mouth. An excellent example produced by IFS, with a title that itself supports the arguments made here, is the booklet *Developing Science, Science for Development – IFS 30 Years* (Schiøler 2002). As an active participant in the production of these stories, I have found that they are important for justifying the importance of the IFS programme to myself, not to mention potential applicants, other employees, scientific advisers, and funding agencies.

The examples that IFS uses are often impressive success stories, and they document how a young scientist with IFS funds was able to generate research findings that had an important impact for sustainable development or the improvement of human livelihoods. One example is the story of the work of IFS grantee Dr. Keto Mshigeni, entitled 'Research on potential sources of the industrial phycocolloids agar, carrageenan and algin in Tanzania'. The results from this work fostered a multimillion-dollar seaweed export industry in East Africa (Gaillard et al. 2002; Schiøler 2002). Another example is Professor José María Gutierrez of Costa Rica, who with his IFS-sponsored project entitled 'Studies on the production and neutralizing capacity of an antivenin for treatment of snake bites grantees in Costa Rica' was a key factor leading to the production of low-cost snake antivenins for use in Central America and Africa (Schiøler 2002). While these stories tell how IFS grantees can have a positive impact on the lives of people in developing countries, they do not show how science leads to development or environmental sustainability.

These technologies convey an argument for the relationship between science and development. They also work to marshal more resources and people to the normative project of scientific capacity building. Though they may be relatively minor in overall importance, these stories are yet another thread in the actor-network that contributes to the realisation of a particular understanding of the purpose and form of scientific knowledge production.

Conclusions

In this paper I have made an attempt to empower Latourian connections, and thereby reach a clearer understanding of the relationship between development organisations, science capacity-building organisations, and the producers of scientific knowledge in developing countries. Specifically, I make a personal reflection on my own work at IFS in the granting programme for social sciences, and try to identify actors and objects that are 'threads' in the actor-network. By borrowing from Foucault-inspired theoretical work on empowerment, governance and subjectivity, I try to show how science capacity builders work to convince developing country researchers to produce particular kinds of knowledge.

In my experience, scientific capacity building is generally treated as a value-neutral and non-coercive project. And, without moralising, I demonstrate in this paper that it is power relationships themselves that make science capacity building possible. An organisation that does not exert power over researchers in developing countries does not have the possibility to create change.

In the case of IFS, we see that histories, individuals, groups and technologies work to create particular understandings of scientific knowledge production. These multiple strands of influence are heterogeneous in the meanings that they convey. The application form and documents work on scientific subjectivities differently than do Scientific Advisory Committees. That it is no simple task to put one in line with the other is explained by the fact that these technologies and actors have their own particular array of constituencies and audiences. Nevertheless, one result of this heterogeneity is that the success rate for social science research grant applications is much lower (approximately 30 per cent less) than for applications from the natural sciences.[9]

Throughout the paper, I am cautious not to overstate the power of IFS in its various forms. Obviously, the filling-in of a form or the reading of a document does not program developing country researchers to produce new knowledge according to the terms of that technology. Nor does it brainwash them with a particular scientific subjectivity. If this were the case we could not call researchers and scientists agents. However, subjecting one's plans and thoughts to these technologies and actions is likely to have some effects, and the examples drawn from applications to IFS provide some evidence of what those effects may be. To further substantiate this, one could build upon the reflections made in this paper, re-centring

[9] This was the case at the time that the paper was written (2006).

the focus of investigation on the developing country researcher and including a discussion of research outcomes. Such a study would make an analysis of scientific knowledge production from the researcher's position in her institution. As a result of this focus, one would not only consider influences that originate internationally, but also local cultures, histories and economies.

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