



**International Development Research Centre
Centre de recherches pour le développement international**

**Linking Science and Development
Fog Water Collection**

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**Presentation at the First International Conference
on Fog and Fog Catchers**

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Ladies and gentlemen - first I would like to thank the organizers for the opportunity to speak at this first international conference on fog and fog catchers. As many people in those parts of the world of greatest concern to Canada's International Development Research Centre (IDRC) are painfully aware, in the categories of liquid and vapour, water and fog are infinitely more precious than oil and gas.

IDRC has been proud to have been associated with one activity in this area, along with other partners in Chile and Canada. The Consul General referred to the joint Chilean-Canadian work in the village of Chungungo.

(In 1987, IDRC supported a joint Chilean-Canadian project to investigate the potential for collecting fog water in the mountains to supply Chungungo, a fishing village on the northern coast. Researchers from universities in Chile and with the Chilean National Forestry Corporation worked with Robert Schemenauer of Environment Canada. Using a simple vertical frame supporting a section of polypropylene mesh, a plastic trough to collect the drops, a pipeline and a reservoir in the village, the water began to flow in 1992.)

I would like to use the project to make a few points about science and development and about the challenges that we all face as citizens, scientists, development workers, teachers and students in looking after the physical, economic and social well-being of our planet.

In fact that might serve as a working definition of development for the purposes of my brief remarks:

looking after and preferably improving the physical, economic and social well-being of life on our planet.

The main point that I would like to make is more to do with science than with development: that science and "S&T" need to be much more inclusive than they often seem to be. There is a silent "S" that needs to be heard if science is to improve its contribution to development. It stands for "social."

Using the Chilean fog-catcher project as an example of the role of science in development and of what IDRC does, leaves me feeling like the two-handed economist. On the one hand, the project has a simple and innovative beauty that captures the imagination. It has all the ingredients that one could wish: improvements in the standard of living of poor people; ingenious use of a free good; environmentally-friendly and continuous supply of water, instead of those expensive, polluting trucks; Canadian-Chilean partnership; and so on. Adlai Stevenson once said (with reference to a very different technology!) that we have "... the power to make the world a desert, or to make the deserts bloom." This fog catching technology shows one way in which we can make deserts bloom, while so many forces seem to be driving in the opposite direction and turning the world into a desert. We need some good news.

On the other hand, if we are not very careful, this example could serve to reinforce the notion

that has bedevilled our world in general and much of the post-war development effort in particular, namely that there is such a thing as a “technological fix” - a magic bullet. As we know, there is no such thing. For this technology to work: in other words, for water to be supplied to poor villagers on a continuous basis, there has also to be a real sense of community ownership of the system; there has to be some form of management organization, in this case a local water authority, to control access, to set prices, to collect revenue and pay the bills; there has to be training in the skills required to maintain the system, order the right spare parts, and so on. These are all social phenomena: management, education, policy-making, governance, institution-building, albeit on a small scale. **Social** innovations in these categories have been essential for the potential of the **technical** innovation to be realised - for the desert to bloom. Not just once, when the scientists and engineers were there to commission the system and turn the tap, but on a continuous basis when they had all gone home and the community had to take over.

This is what I mean by the vital - but often sadly silent - “S” in science and S&T. The scientific community has suffered from the public image of white coats, horn-rimmed spectacles, gleaming laboratory equipment and the implied promise of a marvellous technology. And many of the technologies have indeed been marvellous: (don’t worry, this is not an anti-technology speech) - smallpox vaccine; satellite communications; high-yielding, disease-resistant rice and wheat varieties.... the list is long and impressive. But none of these technical wonders have worked, in the sense of providing enduring benefits to people, without the appropriate social innovations to accompany them.

There is the view that humanity’s social ingenuity has not kept pace with - indeed has fallen disturbingly far behind - its technical wizardry and inventiveness. I would agree with that. We only have to look at the apparent intractability of widespread concerns such as civil conflict, crime, environmental degradation, malnutrition and disease, to name but a few. Such problems are primarily addressed through social arrangements such as governance systems and structures, legal instruments and institutions, policy formulation and effective implementation, and public education - some of them based on appropriate knowledge in the form of new or adapted technology.

We have heard recently that traffic accidents globally are a greater threat to life than AIDS. I doubt if the answer to that one lies entirely in the hands of the mechanics and engineers of Ford and GM. Much social ingenuity and determination will be required.

The third World Science Report of UNESCO was launched last month. I hosted a seminar at IDRC with the Editor to mark the occasion. The report disappoints (through no fault of UNESCO, I hasten to add) in the sense that the “S” is silent and almost invisible. Officially, the S&T indicators that countries provide to UNESCO, such as “R&D Expenditure” and “Number of scientists and engineers”, should include the social sciences and humanities as well as the physical and life sciences. Yet when it comes to presenting the aggregate data on, for example, “scientific output by discipline”, measured by publications, there is everything from fundamental biology to engineering sciences and technology, but no social sciences. In the chapter on

Science in North America (USA and Canada), there is not a single figure or table that recognizes social scientists as part of the scientific community.

Again let me emphasize that I am not *anti* hard sciences or technology - nor do I believe that there is any such thing as a “social fix” either! But I do believe that the balance is wrong, if not in the level of resources and attention given to each area of science, certainly in the application. The two - social and technical - must work together. As the OECD recognized in an important report a few years ago, we need to understand “.....that technological change is fundamentally a social process.” The research, the training and the application that are really going to make a difference for the better are those that keep technical innovation in the context of social innovation. That is why I would rather talk and think about “S&T” as “Social and Technical,” rather than “Science and Technology.”

At IDRC, we have recently taken steps to put this thinking into practice. Instead of structuring and budgeting our programming around discipline-based divisions - agricultural sciences, health sciences, social sciences, etc. - we are encouraging our staff, and by extension, the researchers that we support in the South, to work across disciplines in groups focussing on particular development problems. The starting point is the problem, not the discipline, and budget is allocated to the problem. This in itself is a significant institutional, and therefore social, innovation, with its own complexities and management challenges. But I believe it to be worthwhile. And I cannot help wondering that if there had been a level of investment in research into the *science of managing science for human benefit*, that was even 1000th of what has been spent on (say) military R&D, we would have had some knowledge and even wisdom to guide us. As it is, there is precious little. We and several of our sister institutions feel a bit like pioneers in this field.

This carries a certain sense of excitement, as we think about how to improve the extent to which the scientific enterprise contributes to human well-being, to development. Jane Lubchenco, President of the American Association for the Advancement of Science, recently called for the scientific community to define a new social contract. The current one, based on winning wars and the space race, and conquering disease, is at least partially obsolete. Because of the unprecedented extent of human dominance of the planet, it is knowledge to inform policy and management decisions that is at a premium. She recognizes that the new contract should contain “...innovative mechanisms...to facilitate the investigation of complex interdisciplinary problems.” Even though she is talking about higher levels of science than we deal with in IDRC, we still find that resolution of most development problems requires a measure of at least multidisciplinary, if not interdisciplinarity.

We heard recently that one of our potential partners in West Africa, an economist, complained that he did not know how to approach IDRC. He said that we seemed to have economics in several of our programs. I take this as a compliment and a measure of success. It provides the opportunity to begin a dialogue with the question: “Which problem do you wish your economic research to contribute to solving?” - as opposed to: “What research do you want to do for publication?”

Returning to the World Science Report and the theme of this conference, the report is also encouraging, in that it has an excellent chapter on “Science and the Management of Water.” And better still, from my point of view, this chapter makes it clear that social phenomena - politics, economics, environmental management, policy formulation - are critical for the effective husbandry and distribution of the Earth’s scarce water resources. For example, the means that can be used for the management of demand for water are classified in four groups:

- economic penalties and incentives
- technological means
- legal and administrative means
- education and public awareness

In other words, three out of the four groups involve social innovation of one form or another; and as the report makes clear, the four groups have to work together and are essentially interdependent.

And taking the social context - broadly defined - a stage further, widespread benefits from any technology will only flow if there is also a system of governance in society that is open to the conduct of science; that is open to the free exchange of ideas and knowledge both within a country and from the outside; and that is open to the flow of investment - particularly venture capital - for the proliferation of potential winners. These may not sound like research issues, but I believe that when we talk about “knowledge-based economies” and so on, knowledge of such issues - of how the various mixes of non-technical and technical ingredients can be combined to foster development - is going to be an increasingly necessary part of our search.

On that note, I would like to close with best wishes for a successful conference and with this exhortation: think “Social and Technical,” not “Science and Technology”; and let the “S” for “Social” be silent no longer!

Thank you.