**IDRC
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CANADA

ASSESSMENT INDICATORS
AND THE
IMPACT OF INFORMATION ON DEVELOPMENT

KEYNOTE ADDRESS

Presented at the

1993 CAIS/ACSI CONFERENCE

by

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For more than twenty-five years, I have been actively

involved in the pursuit of matching information need to

information availability. As a result, I have managed all

processes concerned with information acquisition, manipulation

and processing, dissemination and use, and, more recently, the

evaluation of the tools required for these, and the evaluation of

the impact of the information on the decisions and policies made

by the information users.

It is this last aspect upon which I would like to focus my

comments today, by posing the question: "How does one measure

the impact of information on decision-making?" In addressing

this question, I would like to share with you some of the recent

research that is currently underway in the Information Sciences

and Systems Division, of the International Development Research

Centre (IDRC), for which I have responsibility. A bit of

background information may be useful to understand why I believe

that the question I have posed is so critical.

IDRC, created in 1970, by an Act of Parliament, has as its

mission statement: "Empowerment through Knowledge". Its

corporate strategy is based upon the premise that "research

provides the means for the acquisition of appropriate knowledge and thence, for development...". "IDRC is dedicated to creating, maintaining, and enhancing research capacity in developing regions in response to needs that are determined by the people of those regions in the interest of equity and social justice".

The direction of the Centre's work is focused on four main areas:

-       working on global and interregional problems;

-       using research capacity more effectively (a commitment to utilization and to "what works" in development research);

-       working in collaboration and partnerships with Canadian organizations, other donor agencies, and the United Nations system in support of developing countries; and

-       acting as a knowledge broker.

The final component of the Centre's strategy are the four Guiding Principles:

- sharpening IDRC's focus;

- continuity and perseverance;

- an efficient IDRC; and

- assessing IDRC's performance.

Within the Centre's strategic framework, the Information

Sciences and Systems Division has had to formulate the underlying

principle and set of objectives by which its program could be

delivered.   Perhaps Ivan Head, the President of IDRC from 1978-

1991, stated the principle best in his book, <u>On a Hinge of</u>

<u>History</u>. He states, "Always from North to South, information and

methods were passed, principles of governance introduced,

technologies transferred - and always with the assumption that

the Northern techniques and technologies were superior, were

relevant, were transferable, were sustainable. Much more

frequently than admitted, these assumptions have proved false."

(Head, 1991)

It is from this principle that the Information Sciences and

Systems Division has defined its mission: "To stimulate

measurable socio-economic advancement by providing equitable,

timely, and efficient access to scientific, technical, and other

knowledge, and by promoting its effective application to the

problems of development." The Division's program objective is:

"To enhance developing-country capacity to address information

issues locally. By so doing, "it will support a systematic

approach to strengthening selected components of the information

and communication infrastructure."

Information Science has been one of the critical program

areas in IDRC from its creation. Since 1970, over 700 information

science projects have been approved, with a dollar value of over

$136 million. These projects include developing global,

regional, and national information networks, strengthening

information services, facilitating access to information

resources, training personnel to manage information, and research

on the application of information technologies for development

(Akhtar, 1990). Over this twenty-three-year period, a

significant amount of the Division's resources has been dedicated

to the evaluation of the programs and their components, the

individual projects. I feel confident in saying that the
evaluation process has been extremely useful in determining the
quality and quantity of the outputs and products produced by the
projects. The inputs have also been evaluated from the
perspective of effectiveness and efficiency, for example,
financial and human resources, and physical infrastructure.
Thus, from the perspective of input/output evaluation measures,
the Information Sciences and Systems Division is in a good
position to demonstrate how the final project measures up to the
stated objectives.

However, when we considered the question of "impact", that
is "the impact of information on development", it was clear that
there were yet no acceptable impact indicators which could be
identified to be used for measurement. Yes, it is true that, to
date, like in many other information-based organizations, the
"anecdotal" form of assessment has been used - evidence provided
by the end-user as to the importance of the information to
his/her decision-making. On the other hand, what my colleagues
and I wanted to determine, was "is it possible to identify a set

of indicators which will concretely measure the impact of

information, its availability, its system, etc., on decision-

making, or, in the case of the program of IDRC, on the

development agenda." In the remainder of my address, I shall

share with you the research initiative which we undertook to

attempt to answer this question.

In September 1991, in Paris, I gave a keynote address at a

seminar of the European Association of Development Institutes,

Working Group on Information and Documentation (Stone, 1992).

The general theme of my address was "Documentation for

Development: A View from the North", more specifically, from the

perspective of a Development Assistance Agency based in the

North. The focus of my talk was on the role of the information

specialist in the development process, and the many complex

factors which had to be examined carefully, if this specialist

was to remain relevant to this process. It was in this

presentation that I first alluded to the subject of the

assessment of the impact of information on development, as an

approach to answer the "So What?" question about the value of

information and its availability, posed by those who are

accountable for managing the processes for development. It is

they who are the resource allocators, who are also the policy and

decision-makers, and who are the ultimate users of information.

It is they who make the powerful linkage between the availability

of information, its use, and its impact on their own decision-

making.

It is no longer sufficient that information and its

carriers, i.e. systems and services, are deemed to be relevant to

the decision-making or development process because we, as the

specialists, believe it to be so, and we have stories to support

our belief. What is required is a set of tangible criteria by

which the relevance or impact of information on development can

be measured.

An example may be useful here to explain more clearly the

problem we, in my Division, are now trying to address.

IDRC's Health Sciences Division currently is supporting

a major program in community health in Uganda, in East

Africa. The project is being managed by the Faculty of

Medicine at the University of Makerere; however, it is

linked to the Ministry of Health through its Extension

Program. In the early days of the project

negotiations, it was recognized that access to

information was important, but primarily from the

perspective of the needs of the medical researchers and

professors based at the University. Thus, it was

believed that the existing library services provided by

the University and Medical Libraries would be

sufficient to serve their information needs. Very

quickly, however, it became clear that the information

needs of the health policy-makers and resource

allocators, and the information needs of the extension

workers could not be met by the traditional library

services. The sources of information were

inappropriate, the organization and packaging of the

information were not relevant to the problem-solving

tasks of the targeted audience. In other words the

role of information in the process of policy

formulation for a National Health Plan for Uganda was

not understood.

My Division was requested, perhaps at too late a stage, to

support the establishment of an appropriate documentation

centre which would be a key component in the delivery of a

community health program to the country. (Even today, I

need not underscore the critical importance of the health

sector in Uganda). While my colleagues and I looked forward

to participating in this very important project, because I

believed that there was the potential to demonstrate clearly

the importance of information and supportive services to a

stated national development priority, I believed, however,

that a crucial element could be added to this initiative.

Suppose it were possible to demonstrate, through this

project, that the presence of a dynamic information service,

providing equity of access to critical information, was

essential to the success of the development agenda for

health in Uganda. Then, in the future, policy and decision-

makers would take it as a given that information and the
required supporting information infrastructure would be
included in the formulation of any development agenda, at
all levels - local, national, regional, or global.

Another perspective on this problem is that institutions in
developing countries and development assistance agencies have
supported various information projects in developing regions, as
I mentioned earlier within the context of IDRC's program. These
efforts have produced significant results in terms of numbers of
services and systems established, increased access to information
world-wide, increased indigenous capacities in information
management, and the application of modern information
technologies.

We who are engaged in these activities have a firm belief
that these efforts are contributing to the overall advancement of
the Third World. However, there has been no substantial study
conducted to prove this assumption, nor to produce indicators
that would measure the impact of information on development

decision-making. For until now, the assessment of development
efforts has relied mainly upon measures of input or immediate
output. While information specialists point to internal
developments, and claim, for instance, that a 5,000 records
database is now operational, policy makers and decision-makers
understandably look for a clear indication of the overall socio-
economic benefit, and thus ask the question: "So What?" We are
increasingly aware of this fact, and it seems critical now to
identify those indicators by which the impact of information
programs and services can be assessed, to ensure the relevance of
information activities to development, and to provide concrete
answers to decision-makers regarding the value of information and
its role in their work.

From the Ugandan example and this problem statement, it is
clear that the challenge before the information science community
is to identify meaningful indicators, qualitative or
quantitative, by which overall socio-economic impact of
information programs and services can be assessed and the
procedures which will allow the gathering of relevant data.

These indicators should offer a concrete answer to those who control the allocation of resources at whatever level in the process of policy formulation and decision-making.

Thus, in April of 1992, the Information Sciences and Systems Division of IDRC launched an international project to seek out new perspectives on the impact of information on development. The project was designed to explore the apparent dilemma of information being a powerful catalyst to transform society and yet the apparent weakness of the linkage between information investments and the achievement of specific development goals. The project provided an opportunity for leaders in the information science community to initiate a collective effort toward the investigation of these pressing issues. The aim being to produce valid models by which the socio-economic impact of information activities could be assessed and to design a workable framework for creating information programs and information research agenda in the future.

The first step was to undertake a systematic analysis of the

possible benefit of investments in the information
infrastructure, and then move to the identification of meaningful
indicators. Phase one of the project involved an international
electronic dialogue, using the CoSy computer conferencing system
developed at the University of Guelph, with Michel Menou, an
internationally respected information scientist from France, as
conference moderator. The core group of 16 conference
participants, from the private, government, and academic sectors,
was drawn from North America, Europe, and the Third World.

The computer conference instrument was chosen because an
uninhibited and in-depth discussion over a long enough time
period (7-8 months) was felt necessary to address the elements of
a very complex and difficult subject. Not only was little
empirical research ever attempted in this area, but there was no
commonly agreed upon model to guide the investigation.
Conventional methods would have required much of the
participants' time for the preparation of papers, their review,
and a collective synthesis. At least two meetings would have
been necessary. Clearly, this approach would not have allowed

for the level and duration of interaction which the scope and purpose of the conference required. In view of the time constraints and the geographic scattering faced by those who were likely to contribute, the computer conference instrument appeared to be more appropriate, in spite of the fact that it excluded a number of potential participants based in parts of the world where telecommunication facilities are not adequate.

Although there was some concern that the technology might inhibit some of the participants who were unfamiliar with it, it would appear that Robert Jungk's advice on communication and problem solving was most appropriate for the mechanism used and the process followed (Jungk, 1969). Such an effort should be, "Devoted to speculative thinking about the subjects under discussion and at such "crystal-ball" sessions, the old style of presenting findings together with the corresponding evidence will be replaced by a spirit of bold speculation, of free-ranging intellectual experimenting and of realized give and take. An atmosphere of gaiety and of joint search might then replace the atmosphere of so many gatherings today, marked as it is by self-

assertiveness, aggressiveness and possessive pride."

This closed computer conference was expected to allow for

the identification of 1) significant short term and long term

benefits resulting from the various kinds of information

activities; 2) the meaningful parameters, or indicators, both

qualitative and quantitative, by which these benefits can be

assessed; 3) the procedures which will allow the gathering of

relevant raw data; and 4) when appropriate, the methods by which

the suggested indicators could be calculated. In other words, the

conference was to offer a comprehensive and systematic overview

of what is to be monitored and how to do so. (The names of the

key participants in the computer conference and of those who

participated off-line and who contributed commentaries are

included as an annex to this paper.) However, it should be

underscored that the participants were chosen because of their

expressed interest in this subject, and their willingness to

"brain storm" over a period of several months in order to arrive

at a consensus on a more appropriate design of information

systems and services which would increase their utilization,

their relevance to both development and the organizations in which they operate, and their chances of sustainability.

While it was anticipated that the conference was likely to address a number of theoretical and conceptual issues, it was expected perhaps unrealistically to produce results which could be readily applied. Those benefits and related indicators which are amenable to measurements or concrete assessments were to be focused on. Special attention was also given to those indicators likely to produce the required evidence of socio-economic benefits, and possibly returns, as a basis for making decisions about investments in information activities.

Keeping in mind that the computer conference, while it considered from its inception all possible facets of the relationship between information and development, was intended to be a brainstorming and a preliminary investigation, its outcome was quite satisfactory. It was successful in producing a comprehensive and articulated framework, a description of critical issues, and the identification of a number of hypotheses

regarding indicators which could provide evidence of the positive role of information in development. The discussions quickly showed that one is required to break away from the established concepts, concerns, and methods. Of particular significance is the need to question the built-in equality between information and the formal information sector, which has so far dominated the analysis of the move toward an information society in industrialized countries. The change brought by the information society is no longer about production of material goods, it is about thinking and decision-making.

A final word about the process of this first phase of investigation. Although the electronic communication technology was used as a means to achieve clearly stated objectives, and not as an end in itself, we were interested in determining the effectiveness of this mode of dialogue. Thus during the life of the overall project, an evaluation of the process was undertaken by a social psychologist who has written extensively on human-machine interface, Professor Warren Thorngate of Carleton University, Ottawa.

It was demonstrated that carefully designed computer

conferences offer a unique opportunity for the conduct of

investigations at the international level. Participants in a

computer conference can, at their leisure, use the time they want

in order to articulate their points and carry out the "home work"

they feel appropriate. They can provide a comprehensive reaction

to a series of contributions instead of replying spontaneously to

some portion of a previous statement. Their submissions are not

interrupted or delayed or distracted until the floor is given to

them. The interferences from individual roles, group reactions

and emotional perceptions are filtered. These advantages by far

outweigh the constraints, at least for those who are concerned

with the achievement of the common goal rather than their

individual performance.

The bottom line is that this first phase, the computer

conference, was a qualified success; the level of participation

and interaction it achieved compares favourably with face-to-face

meetings or conferences. This is particulary noteworthy since

most participants had no previous experience of computer

conferencing, and several were not users of electronic messaging.

This evaluation report is now being prepared for formal

publication because of our belief in the importance of the

findings and observations (Thorngate and Balson, 1993).

The results of this seven-month "brain storming" by core

conference participants and observers was a theoretical framework

which served as the background document for a workshop which was

held in Nairobi, in March of 1993. The purpose of this second

phase of the project, i.e. the Workshop, was to link the findings

of the computer conference to practical applications. The fifteen

participants of the Workshop were experienced information

professionals and senior policy makers from developing countries,

as well as some of the original computer conference participants.

The objectives of the Workshop were:

-       To review the summary report of the computer

        conference, to discuss the applicability of the

        indicators or models identified in the documents, and

to develop additional indicators and the criteria for
their identification; and,

- To formulate plans for field testing the results in
developing countries.

Using the "working group" approach, the participants
developed three sets of working assumptions from which the common
elements required for the identification of assessment indicators
could be formulated. The first set: the nature of information,
i.e. "information is a strategic resource that is critical to all
levels and to all sectors of society, including development"; and
"information must be communicated interactively from sender to
receiver; information cannot be regarded as just a passive
transfer of data; ideally there should be regular feedback from
receiver to sender". The second set: the role of information,
i.e. "information is produced or collected to satisfy societal
needs at all levels, recognizing that "society" is a
heterogeneous concept and that information can be misused. The
third set: the function of indicators.

In addition, strong emphasis was placed on the fact that the assessment of the impact of information cannot be self-contained, isolated, and a one-time exercise. Rather, assessment should be based on the following principles:

- The assessment process must be beneficiary/user-driven;

- The target audiences for the assessment must be identified;

- Not all assessment indicators will apply in any given situation;

- Assessment should be built into project formulation, not added as an afterthought, and it should be an ongoing process;

- Indicators are needed to identify, measure and evaluate existing infrastructure capacities in the relevant sectors to absorb new resource inputs and to achieve

expected results (outputs);

  - Indicators are also needed to evaluate the degree to which a project succeeds or fails in meeting stated general needs and objectives, efficient resource input utilization, and the effective achievement of results.

After three full days of concentrated discussion and debate, the participants were successful in defining a framework for assessment, as summarized in the accompanying figure. (For related work on this, see Griffiths and King, 1993.) The framework contains four major components.

1.   the object(s) of assessment and assessment perspectives

2.   generic types of assessment measures

3.   derived measures or indicators
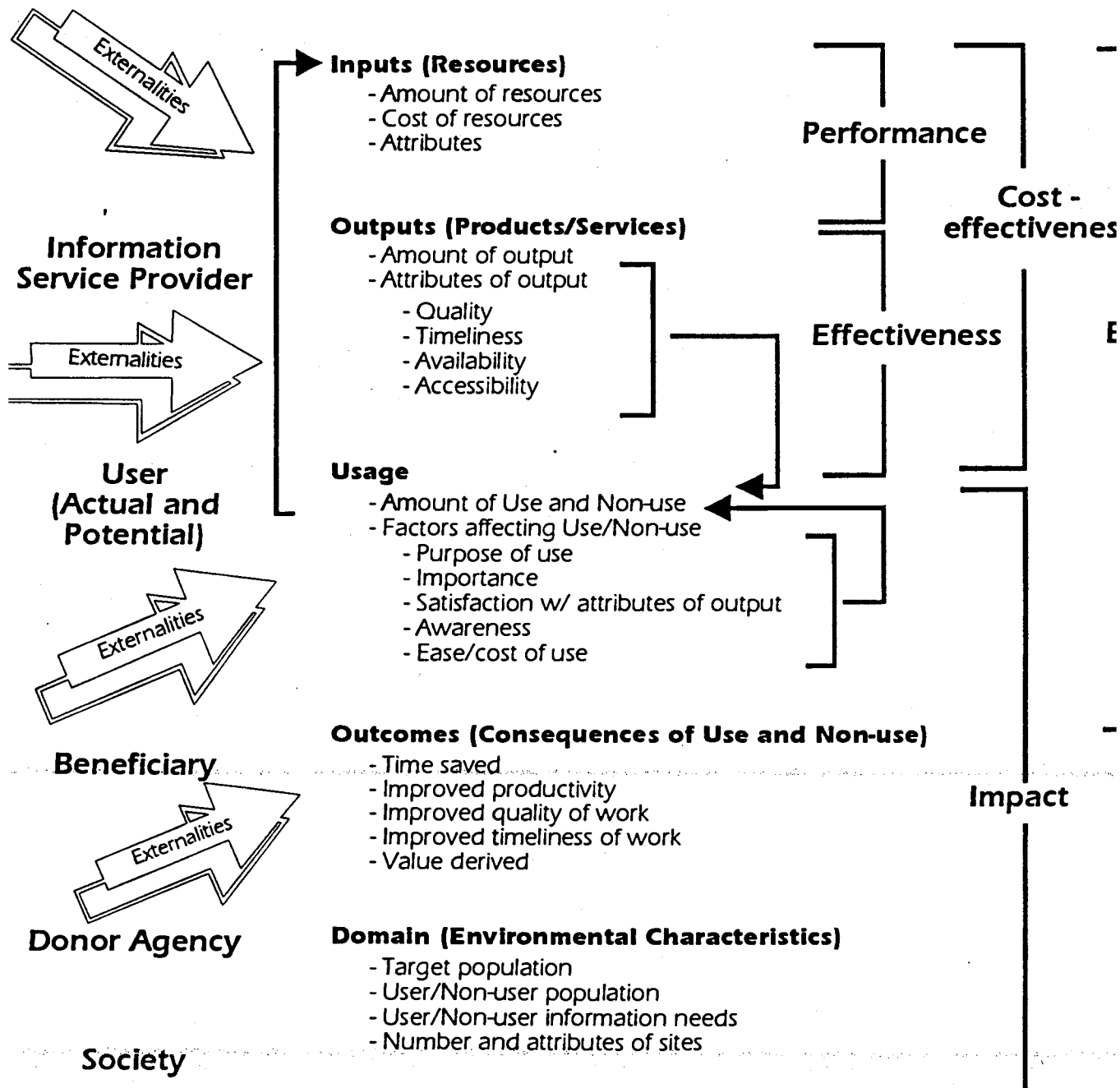
4.   interactions and externalities

Object of Evaluation | Program / Project / Service / Activity / Resource

Evaluation Perspectives

Measures ▭ ▭▭▭▷ **Interaction**

Derived Meas Indicator

Externalities

Information Service Provider

Externalities

User (Actual and Potential)

Externalities

Beneficiary

Externalities

Donor Agency

Society

Inputs (Resources)
- Amount of resources
- Cost of resources
- Attributes

Outputs (Products/Services)
- Amount of output
- Attributes of output
  - Quality
  - Timeliness
  - Availability
  - Accessibility

Usage
- Amount of Use and Non-use
- Factors affecting Use/Non-use
  - Purpose of use
  - Importance
  - Satisfaction w/ attributes of output
  - Awareness
  - Ease/cost of use

Outcomes (Consequences of Use and Non-use)
- Time saved
- Improved productivity
- Improved quality of work
- Improved timeliness of work
- Value derived

Domain (Environmental Characteristics)
- Target population
- User/Non-user population
- User/Non-user information needs
- Number and attributes of sites

Performance

Effectiveness

Cost - effectivenes

Impact

E

Conceptual Framework for Measures: Interaction and Externalities

The measures, themselves, convey little information, other
than perhaps showing trends over time. More information and,
therefore, a more detailed assessment can be achieved through the
development of derived measures or indicators for assessment.
The framework show five types of assessment indicators. These
include performance, effectiveness, cost-effectiveness, impact,
and cost-benefit indicators. In this framework, performance
indicators relate inputs and outputs. Effectiveness indicators
relate outputs and usage. Cost-effectiveness indicators relate
inputs and usage. Impact indicators relate usage/non-usage,
outcomes, and domain characteristics. Finally, cost-benefit
indicators relate inputs and outcomes.

Changes in input or output attributes should affect usage.
Increased usage requires modified inputs to produce modified
outputs. Also, changes in conditions that affect usage will also
affect input and output requirements. Thus, there is an
interactive affect or feedback mechanism built into the

framework. Other extraneous factors of externalities also affect the measurements at all levels. Externalities are beyond the control of the assessor, but play an increasingly important part in outcomes, as the measurement moves from the top part of the framework to the bottom part. Clearly, an area of future research, which was also identified by the Workshop participants, is how to determine causality at these higher levels of assessment.

With the completion of the Nairobi Workshop, two critical phases of the project were completed. The theoretical consideration of the question as to whether assessment indicators could be developed to measure the impact of information on development or decision-making was undertaken by the participants in the computer conference; and the design of a conceptual framework which would guide the formulation of assessment impact indicators was achieved at the Workshop.

We believe that it is critical to document fully all that I have described very briefly here this morning. Toward that end,

IDRC is publishing a monograph which records the full results of the deliberations of the conference and the Workshop, the rationale upon which these initiatives are based, and a full description of the process which was followed. There is little doubt that such a publication will contribute to the knowledge base of the evaluation and assessment field. The publication is expected to be released later in 1993.

The third phase of this project has just begun. Having designed an assessment framework for the indicators, and recognizing that "not all indicators will apply in any given situation", field testing is critical. As a result, three information activities have been identified, in the southern cone of Latin America, in the Caribbean, and in eastern and southern Africa, which will be used as case studies to test the validity of the approach which was developed in phases one and two of the project. This third phase is of a longer term, as some of the projects chosen are three years in duration. As well, over the course of the field-testing, other case studies may also be included. Hopefully, other agencies and institutions will wish

to apply this framework to their own projects.   This form of

collaborative effort is strongly encouraged.

A great deal of work has been undertaken since 1991, when I

first began thinking about tangible ways to demonstrate the

positive impact of information on decision-making, and I feel

confident in stating that much has been achieved.   This will be

more evident when the results of the project are published.

However, during the deliberations of the computer conference and

the Workshop, it became clear that there were many follow-up

activities which should be pursued, if the value of this complex

exercise was to be fully realized.   I will mention just one

initiative which, from the perspective of IDRC, is most exciting.

Principally it addresses the issues of capacity building in

developing countries.   The subject of impact assessment

indicators is large and complex.   There is also a requirement for

a bottom-up approach in the context of information and

development.   There is also the time factor, which is long term.

We are concerned that the time required to fully address this

issue will be so long as to widen the information gap between the

North and the South, and developing countries will not have the necessary tools to correct the imbalance.

We support the creation of a cooperative and collaborative program. It is envisaged that a decentralized international network of interested academic and research institutions would be formed, which would permit the participating institutions to harmonize their approaches, combine their respective efforts with a view to achieve a more thorough coverage of the various problems, constituencies and geographic areas, and, of course, to exchange results and observations. In addition to collaborative research initiatives undertaken by institutions in the North and South, such a program would impact positively on the human resource capacity building in developing countries. In addition, post graduate students, from developing countries, studying in the North, would be able to focus their research on this global issue of the impact of information on decision-making, to areas of relevance to their respective regions.

We therefore propose to convene a meeting with those

institutions who have already identified their interest in participating in such a research network. The purpose of the meeting is to formulate the research agenda, define the nature of the linkages, partnerships, and the governance of the network. More specific information about this initiative will be available soon.

In my remarks, I have touched only briefly upon what I believe to be one of the most exciting research issues in the field of information science. As in the words of Dr. José Marie Griffiths, who has been involved in our project from the beginning, "...we have reached the edge of the envelope..." There are those of us in the field who believe that it is possible to demonstrate concretely, in the language of decisions-makers and resource allocators, the impact that information can have on decision-making. My objective today has been to share with you one approach which, led by IDRC, takes us to the edge of that envelope. Do we dare venture further into unexplored areas? And, if so, how? Clearly, the dialogue has just begun.

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Computer Conference	Consultative Panel	Nairobi Workshop		List of Participants
	x	x		Dr. Wilson O. Aiyepeku, Director, Africa Regional Centre for Information Sciences (ARCIS), 6 Benue Road, University of Ibadan, Ibadan, Nigeria
x				Dr. Toni Carbo Bearman, Dean and Professor, School of Library and Information Science, University of Pittsburgh, Pittsburgh, U.S.A.
		x		The Honourable Betty Bigombe, Minister of State, Prime Minister's Office, Kampala, Uganda
x				Dr. John B. Black, Chief Librarian, McLaughlin Library, University of Guelph, Guelph, Ontario, Canada
		x		Dr. Cecil Blake, IDRC, Regional Office for Eastern and Southern Africa, Nairobi, Kenya
x				Mr. Antonio A. Briquet de Lemos, Consultant, Retired Head of Publications Department, University of Brasilia, Brasil
x				Dr. Cornelius (Neil) Burk, Jr., IMTC, Information Management & Technology Consultants, Ottawa, Ontario, Canada
	x			Fr. Patricio Cariola, s.j., Director, Centro de Investigacion y Desarrollo de la Educcacion (CIDE), Santiago, Chile
		x		Ms. Carol Collins, Information Resources Manger, CARICOM Secretariat, Georgetown, Guyana
x				Professor Blaise Cronin, Dean, School of Library and Information Science, Indiana University, Bloomington, IN, USA
x		x		Mr. Julio Cubillo, Regional Adviser, Centro Latino Americano de Documentacion Economica y Social, UN/CEPAL, Santiago, Chile
		x		Mrs. Nathalie Dussoulier, Director General, Institut National de l'Information Scientifique et Technique (INIST), France

x		x		Professor Stephney Ferguson, Department of Library Studies, University of the West Indies, Kingston, Jamaica
x		x		Dr. Josè-Marie Griffiths, Director, Centre for Information Studies, University of Tennessee, Knoxville, TN, USA
	x			Mr. Nagy Hanna, World Bank, Washington, D.C., USA
		x		Dr. L.J. Haravu, Manager, Library and Documentation Services, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), India
x		x		Dr. Forest Woody Horton Jr., Information Management Press Inc., Washington D.C., USA
	x			Prof. F. Wilfred Lancaster, Graduate School of Library and Information Science, University of Illinois at Urbana Champaign, Urbana, IL., USA
	x		\	Dr. Robin Mansell, Head, Centre for Information and Communication Technologies, SPRU, University of Sussex, Brighton, U.K.
		x		Mr. Paul McConnell, Director, Program Coordination and Development, Information Sciences and Systems Division, IDRC, Ottawa, Canada
	x	x		Mr. Kingo Mchombu, University of Botswana, Department of Library Studies, Gaborone, Botswana
x		x		Dr. Michel J. Menou, Consultant in Information Management Systems, France
x				Mr. Enzo Molino, Centro de Estudios Elèctricas, Mèxico DF, Mèxico
x				Dr. Youssef Nusseir, Director, Information and Computer Software Centre, Royal Scientific Society, Amman, Jordan
	x			Mrs. Anna Maria Prat, CONICYT, Santiago, Chile
x				Mr. Jean Salmona, Director General, Data For Development, France

X				Dr. Rojan Samarajiva, Department of Communication, Ohio State Uniuversity, Ohio, USA
	X			Professor Tefko Saracevic, School of Communication, Information and Library Studies, Rutger, The State University of New Jersey, New Jersey, USA
X		X		Mrs. Martha B. Stone, Director General, Information Sciences and Systems Division, IDRC, Ottawa, Canada
	X			Dr. Karl Stroetmann, Schubert-Strasse 5, D-W 5200 Siegburg, Germany (Formerly with the Forschungsstelle für Informationswirtschaft, Gesellschaft für Maschinelle Dokumentation)
	X			Professor Robert S. Taylor, Professor Emeritus, Syracuse University, Syracuse NY, USA
		X		Dr. Louis Vagianos, IDRC Consultant, Blandford Information Specialists, Toronto, Canada
	X			Mr. Arthur Vespry, Library and Regional Documentation Centre, Asian Institute of Technology, Bangkok, Thailand
X				Mr. Robert A. Vitro, Director, Global Business Development, Information Industry Association, Washington D.C., USA
	X			Ms. Nancy M. Wildgoose, Director General Policy Coordination, Policy and Communications, National Defence Headquarters, Ottawa, Canada