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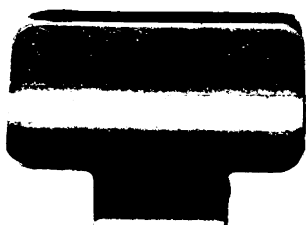
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Integrated Natural Resource Management



Richard Edwards
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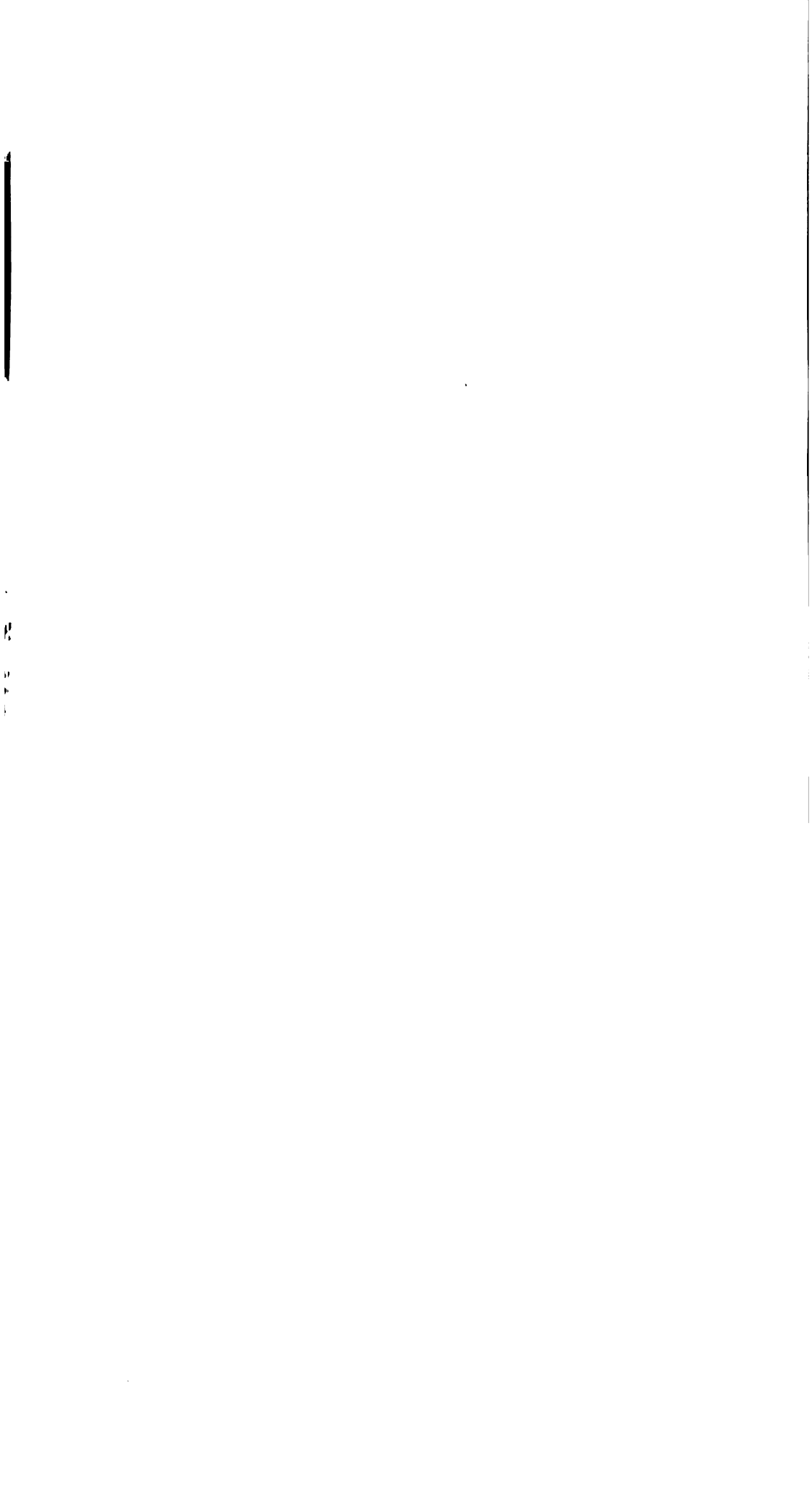
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Alarming rates and levels of natural resource degradation are increasing the demands from international organizations and national governments, through meetings such as the various Summits of the Americas, for a revamped system of natural resource management. The system should be both viable and effective, while supporting a long-term vision toward Sustainable Development (SD) and natural resource conservation.

The most reliable statistics on deforestation, water pollution, soil erosion, desertification, socio-economic inequity, and loss of biodiversity, among others, underscore the urgency to examine our managerial strategies regarding natural resources. These statistics and the situation they describe suggest the need for a shift in the “paradigm” for managing our natural resources.

What is required is a new development framework legitimizing a system of management that explicitly seeks to incorporate the needs and opinions of all major groups of stakeholders (governments, institutions, private enterprises and individuals) in development planning and implementation.

Integrated Natural Resource Management (INRM) “is essential to maintaining healthy ecosystems. Water, soil, air, biodiversity and human resources are interrelated; changes in one can affect the others. This interdependence often extends beyond village boundaries or national borders, and for that reason a landscape ecology approach emphasizes comprehensive project design and participation at all levels.” (Winrock International, 1998). Also included in this document is a matrix of communication and interaction generated and maintained through INRM. Through the use of this matrix during the implementation of INRM, policies are subject to a thorough analysis by all affected stakeholders.

To date, a common definition of INRM, one which has been reviewed by a number of institutions and governments at all levels, has yet to be produced. IICA sees the need to embrace the meaning of “integrated” in its entirety in applying it to SD in rural scenarios as a key to arriving at an all-encompassing and operational definition of INRM.

Integrated Natural Resource Management is the process of planning strategies, methodologies, projects, policies, etc. for the rational use of natural resources within a given spatial unit. In doing so, the demands on the resources from all sectors must be harmonized to best satisfy the needs of each, while taking into account the limits in supply and ensuring sustainable use of the resources in the particular space.

In order to achieve this balance, a multi-sectoral and multi-dimensional system incorporating a comprehensive methodology of communication, conflict resolution, direction, and information dissemination should be put into place. Though proponents see INRM as an active and dynamic framework to be used in directing future policy-making, research efforts, and implementation of ecologically sound development practices, its use based on this perspective in resource management is new.

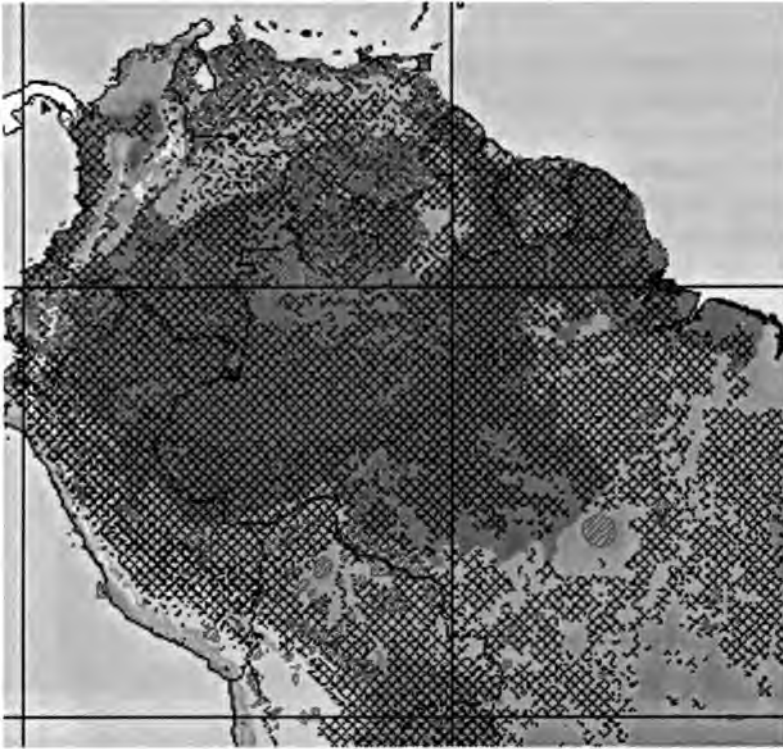
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TRANSCENDING POLITICAL BORDERS: EMPHASIZING ECOSYSTEMS

Given its focus on landscape ecology and ecosystem management, the future of INRM as a method for reaching and maintaining SD should also be seen in its international dimension. Ecosystems, especially those which are large in scale, tend to cross political boundaries, including international borders; hence, eventually transboundary effects will have to be dealt with at some point in the process. Dealing with potential transboundary effects adds a level of complexity to the planning process that will challenge national political authorities. The map of the Amazonian region below shows how the homogeneous nature of an ecosystem reaches across any level of political boundary.

In this context, proposing additional legally and institutionally supported boundaries around ecosystems will usually lead to conflict. Conflicts normally arise during the implementation of INRM (i.e., landscape processes and ecosystems do not conform to existing political jurisdictions either within countries or among them). Consequently, power vested in existing jurisdictions is threatened when new structures are called for in dealing with ecosystems. An additional repercussion is that management plans frequently lack legitimacy since they do not correspond to any existing political/administrative entity. The implementation of INRM should allow for the future development of managerial strategies that apply to the entire ecosystem and may be transboundary in scope.

AMAZONIAN ECOZONES



Legend

ECOLOGICAL ZONES

- Lowland wet
- Lowland very moist
- Lowland moist with short dry season
- Lowland moist with long dry season
- Lowland sub-dry
- Lowland very dry/sub-arid
- Lowland arid/desertic
- Premontane moist
- Premontane dry
- Montane moist
- Montane dry
- Alpine
- Non-tropical moist
- Non-tropical dry
- Mediterranean

FORESTS

- Forest extent

PROTECTED AREAS

- IUCN categories I-VI

Compiled by
World Conservation Monitoring Centre
May 1997

Projection: Geographic

0 1500 Km



WORLD CONSERVATION
MONITORING CENTER



Through this type of management system, the initial complications arising between nations, or even between smaller intranational governmental entities (states, municipalities, etc.), are compensated for when stresses faced by an ecozone are addressed homogeneously. A willingness to begin to measure the benefit-cost ratio of this type of effort is currently being demonstrated by the participants in the Amazonian Cooperation Treaty in order to optimally manage the Amazonian watershed as a homogeneous spatial unit.

Prices for goods and services must truly reflect economic, social, and ecological costs. Comparative advantage should not be determined when exploitative labor practices exist and/or unsustainable methods of resource utilization are being employed. Methods such as contingent valuation need to be put in place to internalize non-market social and ecological costs, which currently are most often externalized and imposed upon society as a whole.

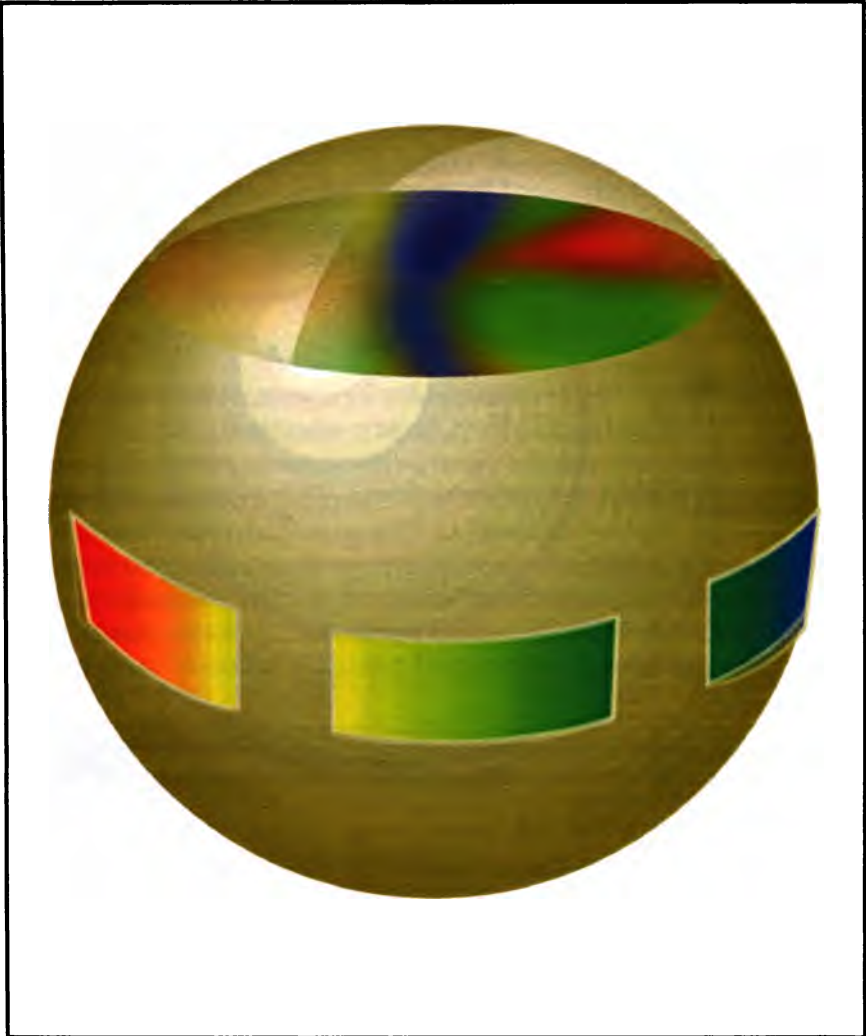
Obviously, if the ecosystem services aren't assigned a monetary value, which is later translated into a cost, the total production costs are underestimated. Private enterprises and governments then use these underestimated values to justify production, which greatly benefits a few people while damaging the environment. At the same time, the probability decreases for long-term sustainable agricultural development, beneficial for all stakeholders in the long run. Depending on the amounts of the unincorporated costs, the actual comparative advantage claimed by a locality, sub-region, nation or region may not even exist.

In order for INRM to become a reality in Latin America and the Caribbean, communication channels must be created, improved, and treated as one of the most fundamental aspects necessary for the successful actualization of this concept.

Therefore, the challenge of convincing all the stakeholders involved that the lack of communication resulting from prejudices that have been cultivated and reinforced over time between professions, socio-economic classes, races, etc. is a prime barrier to reaching a mutually beneficial steady-state of development.

Mechanisms (leading to the "INRM communication matrix") should be devised that would allow for the tightening of links between different levels and sectors i.e. improving communication between the agricultural sector and industry in order to best satisfy the resource demands of both. In Chapter 8, Agenda 21 addresses a "policy framework that reflects a long-term perspective and cross-sectoral approach as the basis for decisions, taking account of the linkages between and within the various political, economic, social and environmental issues involved in the development process." This would

INTEGRATED NATURAL RESOURCE MANAGEMENT COMMUNICATION MATRIX



- **Ecological**
- **Political - Institutional**
- **Social**
- **Economic**

allow a free-flowing exchange of ideas between two groups to discuss transboundary issues affecting them directly or indirectly. And the intention would be that these links would someday be nearly as accessible as the exchanges taking place within each group.

Another goal of the matrix would be to reach those who may not have even been aware that they might be affected in the future by the process or outcome of the proposed

issue. In this manner, the intricacy and complexity of the cooperation matrix become more apparent. Hence, policies being considered by governments, institutions, universities, agricultural cooperatives, individual enterprises, etc. should integrate elements addressing communication with other groups as part of their management plan.

One tool, which is predicted by most to have an ever increasing influence on the way INRM will function in the future, is the Internet. Of course, in practice it will not suffice as the only means of communication. However, the ideal INRM matrix, making use of all forms of communication, would function very much like the Internet does now.

While the world of virtual reality becomes more available throughout the hemisphere, every user will have some form of access to almost every other user, regardless of that user's role in the larger scheme. There are necessary constraints and exceptions to this rule, but these are relatively few. To date, those with access to the Internet have been able to express their opinions on any subject that may directly or indirectly affect them now, or in the future. The interchange is constant and relatively without barriers.

As this network is established and cultivated, becoming more intertwined and intricate, the resulting products will be much more likely to possess long-term staying power by virtue of the increase in direct and indirect influences and inputs overseeing their development. Ideally, this is the case from inception, through evolution, and continuing on to the realization of a formal and enforceable, yet still dynamic, conceptual and operational management tool.

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CREATING A LEGAL FRAMEWORK: TERRITORIAL AND PROPERTY RIGHTS

The products of a meeting conducted by the National Councils for Sustainable Development (NCSD) included an Agreement of Reciprocal Assistance between Regional Parliaments for Sustainable Development and the Environment. A portion of this document reads:

“...it is essential to promote, strengthen and integrate at the Latin American and the Caribbean regional level all those actions and mechanisms aimed at incorporating into regional parliaments those processes which contribute to create legislation, poli

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cies and principles that may assure a better quality of life for their peoples, as well as social equity, integration of public participation, with due respect to cultural and ethnic elements through the creation of laws that include regional priorities regarding sustainable development and the environment.”

As a general and preliminary statement, paramount among the policies that must be either created or reinforced are those addressing territorial and property rights at all levels. Firm legislation should be implemented to govern eventual international policy-making and transboundary enforcement concerning issues such as resource extraction and land use at the ecozone level for an INRM system to function.

For several reasons, some alluded to by the NCSD, even the smallest landholder needs to be more strictly protected within the framework of an environmentally sound INRM plan. Apart from the moral issues, such as social equity and cultural preservation, many studies and projects have produced solid evidence demonstrating that small landholders can increase production and reduce natural resource degradation when land tenure is backed by secure legislation.

RESOLVING CONFLICTS

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With in the definition of INRM given earlier, an effective way of managing economic development, in conjunction with the rational management of natural resources, is to involve all economic and social actors in a system of participation, interaction, communication and conflict resolution, while maintaining an effective and legally binding system to resolve the inevitable disputes.

Further investigation into approaches to conflict resolution proposed by the IICA, FAO, and the Center for International Development and Conflict Resolution at the University of Maryland, and a number of other institutions and private enterprises, provides the following synthesis of the alternatives to traditional court litigation:

Arbitration- a previously agreed upon neutral party hears arguments from both sides of a dispute and then makes a (normally) binding decision, usually choosing the position of one side, instead of trying to broker an agreement.

Conciliation- the neutral party convinces the two parties in the dispute to meet and resolve the problem, with no further involvement by the conciliator.

Direct negotiation- without the help of an intermediary,

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the two sides simply meet and attempt to reach an acceptable solution.

Facilitation- is a less active form of mediation. Facilitators are not expected to volunteer their own ideas or participate actively in pushing the two sides toward agreement.

Mediation- a process where the parties to a dispute meet together and separately in confidence with a neutral and independent outside party, called the mediator, to help reach an agreement. A mediator isn't given the authority to resolve the conflict, but has the right to more input than a facilitator.


Negotiated rule-making- New rules, in the form of public policy, are created through negotiations by representatives from all actors involved.

Realizing that conflicts will arise as a natural outcropping of INRM systems, solutions will be much more easily attainable if a structured and legally enforceable conflict resolution program is in place.

While both SD in agriculture and INRM are vague, subjective concepts with visions to the future, both are currently incorporated in national and international planning documents and protocols, including the Brundtland Commission report, Agenda 21, and the strategic plans of the OAS's Inter-American Council for Integral Development (CIDI).

As an example, Chapter 14 of the U.N.'s Agenda 21 stresses the need to "strengthen and establish national, regional and international systems and networks to increase the understanding of the interaction between agriculture and the state of the environment, identify ecologically sound technologies and facilitate the exchange information on data sources, policies, and techniques and tools of analysis."

As a result, incorporating INRM into a multi-sectoral and a multi-level framework of analysis has been detected by IICA as part of an ongoing institutional transformation leading to SD in the agricultural sector. This points to at least two general implications for change. In both, a lack of interaction and communication among the actors at the time of policy development produces unintended social and ecological consequences, given that the policies are based upon incomplete information.

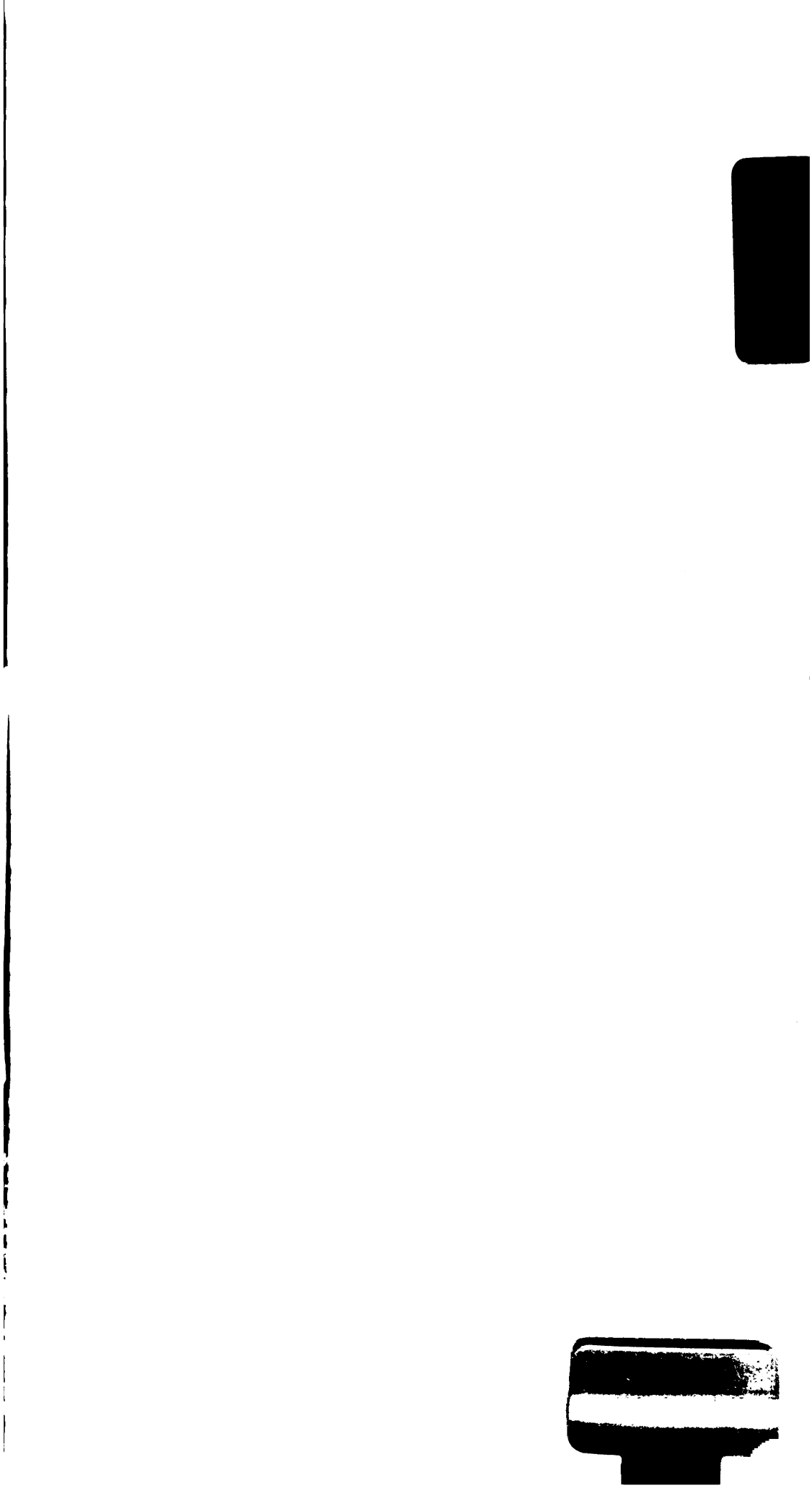


First, national governments should begin harmonizing national institutional policies related to natural resource management and SD with the policies of neighboring countries. In doing so, links would be created across international borders between institutions, which may be structurally different, but are charged with similar responsibilities by their respective governments.

The other aspect that should be considered is the interaction of intranational stakeholders. National governments and institutions attempt to guide development planning and implementation without the benefit of input from other levels of policy-making entities or, perhaps more importantly, the valuable input that may be provided by the intended beneficiaries.

Also, at present, the norm for policy development includes only consultation of the intended direct beneficiaries. IRNM would facilitate the inclusion of input from all those directly and indirectly affected by a given policy or project. Many of the present barriers to sustainable development can be traced to these narrow channels of communication. Hence, development planning would benefit from INRM communication matrices developed for specific projects by expanding upon the lessons learned from attempting to bring together the various stakeholders from the different sectors.

- Agenda 21 & Other UNCED Agreements**
<http://www.igc.apc.org/habitat/agenda21/index.html>
- Argonne National Laboratory (ANL), Strategic Natural Resources Management Methodology**
<http://clean.rti.org/serdp/comb.htm>
- Canadian Government: An introduction to Canada's Ecozones**
<http://www.cprc.uregina.ca/ccca/ecozones/intro.html>
- CIFOR**
<http://www.cgiar.org/cifor>
- FAO-Special integrated coastal area management**
<http://www.fao.org/WAICENT/faoinfo/sustdev/epdirect/cpre0049.htm>
- Integrated Natural Resource Management Automation IRMA**
<http://starr-www2.tamu.edu/irma.html>
- Institute for Development Studies**
<http://www.ids.ac.uk/ids/research/env/env98.html>
- IUCN- Commission on Ecosystem Management**
<http://Iucn.org/themes/cem/about.html>
- MDSMA/FONAMA/COSUDE/PROJEKT-CONSULT**
<http://coord.rds.org.bo/miembros/medmin/prcsen.htm>
- Pact Latin America**
<http://pactworld.org/Programs/lla.html>
- Winrock International Forestry and Natural Resource Management**
www.winrock.org/FORESTRY/FORESTRY.HTM
- World Bank- Executive Summary (NEAPs)**
<http://www-esd.worldbank.org/html/esd/env/publicat/edp/edp1002.htm>
- WorldWatch Institute**
<http://www.worldwatch.org/mag/1999>



transformation and alterations promoted by the Institute with the hope of reaching sustainable development in agriculture. For example, local governments and municipal organizations should be able to have access to neighboring local institutions and governments, with few constraints, as well as to regional and national governments. At the same time, individuals and businesses would be included in this chain and given the same ease of access to all other actors in what is seen by the Institute as a communication matrix.

A secure legal framework, developed and backed by multiple levels of government, that emphasizes the interconnectedness of the actors in the quest for economically and environmentally sound sustainable development is important. The framework should have jurisdiction to enforce newly created laws concerning territorial and property rights and land use decisions, the scope of which may cross political boundaries and borders.

A functional INRM framework further contains mechanisms to mediate conflicts arising from issues such as comparative advantage or absolute advantage, which can attract the attention of multiple sectors and multiple levels. Also, the basic economic premise of supply and demand, complicated by such location specific differences as infrastructure and distribution channels, affects inter-sectoral questions at all levels.

Many other issues have similar multi-sectoral and/or multi-level implications. Thus, the importance of investigation into efficient ways to create and maintain fluid politically and institutionally robust INRM systems as instruments for sustainable development comes to the fore. The Institute's response to this challenge involves instigating discussion between a multi-disciplinary audience of professionals working in agriculture and natural resource management. The present publication and those mentioned below are meant to facilitate the dialogue on these topics.

- "Defining Integrated Natural Resource Management for Sustainable Development"
- "A Paradigm Shift toward Integrated Natural Resource Management"
- "INRM- A Path to Solutions"
- "Adaptive Management- A Key to Successful INRM"

Further information and links related to this subject are located on our Web site at: www.infoagro.net/codes