

Communication for Agricultural Innovation in Bolivia



The challenge of institutionalization

In collaboration with:



Communication for Agricultural Innovation in Bolivia

The challenge of institutionalization

In collaboration with:

University of Reading, United Kingdom

Instituto Nacional de Innovación Agropecuaria y Forestal, Bolivia

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views of FAO.

All rights reserved. FAO encourages reproduction and dissemination of material in this information product. Non-commercial uses will be authorized free of charge, upon request. Reproduction for resale or other commercial purposes, including educational purposes, may incur fees. Applications for permission to reproduce or disseminate FAO copyright materials, and all queries concerning rights and licences, should be addressed by e-mail to copyright@fao.org

or to

the Chief, Publishing Policy and Support Branch,
Office of Knowledge Exchange, Research and Extension,
FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy.

© FAO 2011

Acknowledgement

This document was prepared by Marzia Pafumi, Communication for Development specialist. It was developed in the framework of the FAO interregional programme GCP/INT/048/ITA *Communication for Sustainable Development Initiative (CSDI)*, promoting communication as a key for sustainable natural resource management, food security and climate change adaptation. A sincere appreciation goes to Dr Mario Acunzo, CSDI Lead Technical Officer, for the insights and support provided to the development of this study.

This paper draws on the outcomes of the author's MSc in Communication for Innovation and Development, conducted under the valuable supervision of Prof Chris Garforth at the Graduate Institute of International Development and Applied Economics, University of Reading.

The author would like to address her special thanks also to: FAO representation in Bolivia for assistance during the fieldwork; Pedro Gutierrez, director of CARENAS, for sharing his precious time and experience; INIAF staff in national and departmental offices, for the kind support and friendly collaboration; Lawrence Fort for proofreading the final draft of this paper. Last but not least, the contribution of every single participant in the research is highly appreciated.

Table of Contents

List of Tables	v
List of Figures	vi
List of Boxes.....	vi
Acronyms	vii
Introduction	1
I - Communication at the heart of integrated Agricultural Innovation Systems	4
1.1 New perspectives on rural development	4
1.2 Rethinking agricultural extensions	6
1.3 Knowledge and information in Agricultural Innovation Systems	9
1.4 The role of communication for innovation and development	13
Functions and challenges of rural communication	15
1.5 Governance in Agricultural Innovation Systems	17
1.6 Institutionalization as a multidimensional process of change	19
II – The Bolivian Agricultural Innovation System	21
2.1 Rural livelihoods in Bolivia	21
2.2 National policies for rural development	24
Decentralization and Popular Participation Law	24
A new policy framework	25
2.3 Evolution of the institutional framework for rural extension	26
SAI: classic extension model	28
IBTA: conventional state institute model	28
WB project: ‘progressive farmer’ model	29
SIBTA: privatized demand-led extension model	30
III – INIAF: towards a public and decentralized service for agricultural innovation	33
3.1 INIAF vision and mission	33
3.2 Institutional design	36

3.3 Position in the national AIS	38
A perceived technical / political dichotomy	41
3.4 INIAF extension and communication services	42
Participatory extension methodology	42
INIAF's understanding of communication	46
IV – Institutionalizing rural communication for development in Bolivia ..	49
4.1 Tracking best practices in rural ComDev	49
4.2 Overview of FAO ComDev experience in Bolivia	51
4.3 Institutionalizing rural communication at the local level	53
Local Information and Communication Plans	56
4.4 Local stakeholders and the institutionalization process	56
4.5 CSDI and the National Communication Plan	63
V – Mainstreaming rural communication services in Bolivia	65
5.1 Communication for rural innovation in Bolivia: key findings	65
5.2 Insights and recommendations	69
Steps towards sustainable rural communication services	72
References	76

List of Tables

No.	Title	Page
1.1	Characteristics of different extension approaches	7
1.2	Defining features of AKIS and AIS frameworks	11
1.3	General communication functions in innovation systems	15
2.1	Institutional frameworks for rural extension/ advisory services	27
3.1	Defining features of INIAF in relation with IBTA and SIBTA	35
3.2	Situation of research centres in Bolivia's macro eco-regions	39
4.1	Local stakeholders' perspectives on rural communication services	58
5.1	Opportunities and constraints for institutionalizing ComDev	70

List of Figures

No.	Title	Page
1.1	Rural development ideas timeline	5
1.2	Agricultural Knowledge and Information Systems for Rural Development	10
1.3	Agricultural Innovation System (AIS)	12
1.4	General communication functions in innovation systems	19
2.1	Indigenous people distribution (FAN Bolivia)	21
2.2	Bolivia's eco-regions	22
2.3	Bolivia's land use (FAN Bolivia)	23
3.1	INIAF crosscutting role among the MDRyT services	34
3.2	INIAF organigram	37
3.3	Extension stakeholders in the Bolivian AIS	39
3.4	Distribution of extension providers in Bolivia	40
3.5	INIAF Technical Assistance Methodology	44
4.1	FAO's interaction with the policy environment	54
4.2	Evolution of communication service provision in Santa Cruz	55

List of Boxes

No.	Title	Page
2.1	Pioneering experiences of communication for rural innovation	28
3.1	Notes from INIAF introductory workshop in Yacuiba	38
4.1	Boosting innovation through horizontal communication	50

Acronyms

AIS	Agricultural Innovation System
AKIS	Agricultural Knowledge and Information System
ATS	Seed Technical Assistance (Asistencia Técnica Semillera)
CARENAS	Capacity development for Natural Resources Management and Sustainable Agriculture (Capacitación en Recursos Naturales y Agricultura Sostenible)
CECODER	Centre for Communication and Rural Development (Centro de Comunicación y Desarrollo Rural)
CECOR	Centre for Rural Communication (Centro de Comunicación Rural)
CBO	Community Based Organization
CIAC	Community Agricultural Research Centre (Centro de Investigación Agrícola Comunal)
CIAT	Tropical Agriculture Research Centre (Centro de Investigación Agrícola Tropical) or International Centre for Tropical Agriculture (Centro Internacional para la Agricultura Tropical)
ComDev	Communication for Development
CSDI	Communication for Sustainable Development Initiative
DFID	UK Department for International Development
FAN	Friends of Nature Foundation (Fundación Amigos de la Naturaleza)
FAO	Food and Agriculture Organization of the United Nations
FDTA	Foundation for Agricultural Technology Development (Fundación para el Desarrollo de Tecnología Agrícola)
FIT	Fostering Technological Innovation (Fomentando Innovación Tecnológica)
GFRAS	Global Forum for Rural Advisory Services
IBTA	Former Bolivian Institute for Agricultural Technology (Ex Instituto Boliviano de Tecnología Agropecuaria)
ICT	Information and Communication Technology
IFPRI	International Food Policy Research Institute
IICA	Inter-American Institute for Cooperation on Agriculture (Instituto Interamericano de Cooperación para la Agricultura)
INIAF	National Institute for Innovation in Agriculture, Livestock and Forestry (Instituto Nacional para la Innovación Agropecuaria y Forestal)
MDRAyMA	Ministry of Rural Development, Agriculture, Livestock and Environment

	(Ministerio de Desarrollo Rural, Agropecuario y Medio Ambiente)
MDRyT	Ministry for Land and Rural Development (Ministerio de Desarrollo Rural y Tierras)
NARS	National Agricultural Research System
NGO	Non-governmental Organisation
NRM	Natural Resources Management
OTB	Grass-roots Territorial Organisation (Organización Territorial de Base)
PDM	Municipal Development Plan (Plan de Desarrollo Municipal)
PLICs	Local Plans for Information and Communication (Planes Locales de Información y Comunicación)
PND	National Development Plan (Plan Nacional de Desarrollo)
PNS	National Seed Programme (Programa Nacional de Semillas)
PPL	People's Participation Law (Ley de Participación Popular)
PROINPA	Foundation for Research and Promotion of Andean Crops (Fundación Boliviana para la Investigación y Promoción de los Cultivos Andinos)
R&E	Research and Extension
RCS	Rural communication services
SAI	Former Interamerican Agriculture Service (Ex Servicio Agrícola Interamericano)
SBI	Bolivian Innovation System (Sistema Boliviano de Innovación)
SEARPI	Service for Channelling and Regulating the Piraí River (Servicio de Encauzamiento de Aguas y Regularización del Río Piraí)
SIBTA	Former Bolivian Agricultural Technology System (Ex Sistema Boliviano de Tecnología Agrícola)
SLAS	Local System of Seed Supply (Sistema Local de Abastecimiento de Semillas)
UDAPE	Bolivian Economic Policy Analysis Unit (Unidad de Análisis Político-Económica)
UNDP	United Nations Development Programme
UNODC	United Nations Office on Drugs and Crime
ToT	Transfer of Technology
WB	World Bank

Introduction

Agricultural innovation happens within a particular institutional and policy environment, where various rural actors with different views and interests coexist and interact. Within an integrated system, based on dynamic networks and knowledge flows, communication emerges as an implicit, but key element for dialogue, mediation and coordination. Sustainable innovation is in fact a social learning process: it requires collective decisions and adaptive interactions, which gradually lead to change. Communication plays a central role in facilitating stakeholders' participation, negotiating between national priorities and local demands, enhancing institutional coordination and strengthening agricultural service provision.

Based on this conceptual framework and centred on the particular context of Bolivia, this document focuses on *Agricultural innovation systems (AIS)* and the potential for communication to be institutionalized as part of the service supply of rural knowledge institutions. In particular, it aims to identify major influential factors for mainstreaming communication services into agricultural and rural development policies at national and local levels.

To this end, the paper presents an overview of the institutional and policy framework where the *Bolivian Institute for Innovation in Agriculture, Livestock and Forestry (INIAF)* currently operates. It examines the agricultural innovation system and relevant experiences in communication for rural development, to contextualize and assess the demand–supply dynamics of information services in the country. It assesses methods and approaches currently used, along with suitable delivery mechanisms that would enable the provision of communication services in rural areas. Finally it looks at opportunities and constraints for the integration of communication services in the Bolivian AIS, with the general aim of contributing to the development of demand-driven and participatory agricultural advisory services, based on the adoption of ComDev methods and tools.

Methodology

This case study investigates three different dimensions: (a) the Bolivian agricultural innovation system; (b) the country situation in communication for rural development; and (c) a local institutionalization process in the Santa Cruz Department.

The research methodology consisted of:

1. Review of secondary data

Governmental plans, communication strategies, project reports, INIAF internal documents, specialized publications, books, articles and research papers were reviewed in order to familiarize with the context.

2. Field research and collection of primary data

In addition to field visits, observation, mapping of stakeholders and analysis of communication materials, the data collection was based on a qualitative, mainly narrative approach. It made use of focus groups and semi-structured interviews with open-ended questions standardized for all interviewees. Overall thirty actors of Bolivia's agricultural innovation system were engaged, including:

- a. key national informants (from the INIAF directive board and other institutions) – to outline the context of rural information and communication services and assess their demand / supply at the national level;
- b. local communication professionals – to gain insights into the actual practice of communication for development in Bolivia, focussing on agriculture, forestry and natural resource management;
- c. local providers of information and communication services in the Santa Cruz Department, as well as community stakeholders, municipal staff and decision-makers – to understand the efforts made to institutionalize rural communication services in a specific local context.

3. Triangulation with case study informants

A summary of findings from the field study was shared and discussed with FAO local officers and the INIAF Information and Communication Unit, as well as with the ComDev team at FAO headquarters, to get direct feedback and validation.

Paper structure

Chapter I builds on relevant literature to define key issues and trends in the current debate on communication services for rural development, and highlights the role they

can play in agricultural innovation systems (AIS). It also draws attention to challenges related to the processes of up-scaling and institutionalization.

Chapter II presents useful background information on the Bolivian context to understand the country's agricultural innovation system. Prior to analysing the present situation with the newborn INIAF, a longitudinal perspective is adopted to describe the evolution of extension models in the country and the recent process of institutional change that may favour the mainstreaming of rural communication services.

Chapter III focuses particularly on INIAF's institutional model and approach to rural extension and advisory services. At the time when the field research was carried out, INIAF was not yet operating as the leading knowledge institution within the agricultural system and very little documentation was available. Field observation and interviews provided useful insights into the institutional dynamics and its position within the system¹.

Chapter IV introduces significant experiences in communication for rural development implemented in Bolivia, especially those promoted by FAO. It examines rural communication activities carried out in the Santa Cruz Department until 2009, comparing the different perspectives of the range of stakeholders involved, and identifies successes and failures in the local process of institutionalization. Attention is given to the most recent efforts conducted by FAO Communication for Sustainable Development Initiative (CSDI) to integrate a national communication plan in the work of INIAF, although CSDI activities were just beginning at the time of the research.

Chapter V finally uses findings to support with reasoned evidence an answer to the central research question: *what institutional and methodological elements can be influential to institutionalize rural communication services within the Bolivian agricultural innovation system?* Only to some extent do the conclusions of this study apply to contexts other than Bolivia. However, readers may draw useful insights on the role of rural knowledge institutions and how to support the integration of rural communication services in multistakeholder innovation systems.

¹ The analysis considers INIAF as part of the Bolivian AIS and includes external agents and informants; however, it does not cover systematically the entire AIS. Moreover, no concrete appraisal of INIAF extension methodology was possible during the field research, given the temporary reduction of activities, but staff's demands and reflections on the role of communication were recorded.

I – Communication at the heart of integrated Agricultural Innovation Systems

In integrated agricultural innovation systems, communication enables participatory processes through a two-way flow of information and knowledge. Its role in support of network building, negotiation and coordinated action among all stakeholders is central to sustainable innovation and rural development. But for communication services to be institutionalized, particularly in government-led structures, a whole set of changes is needed at the policy, organizational and individual levels.

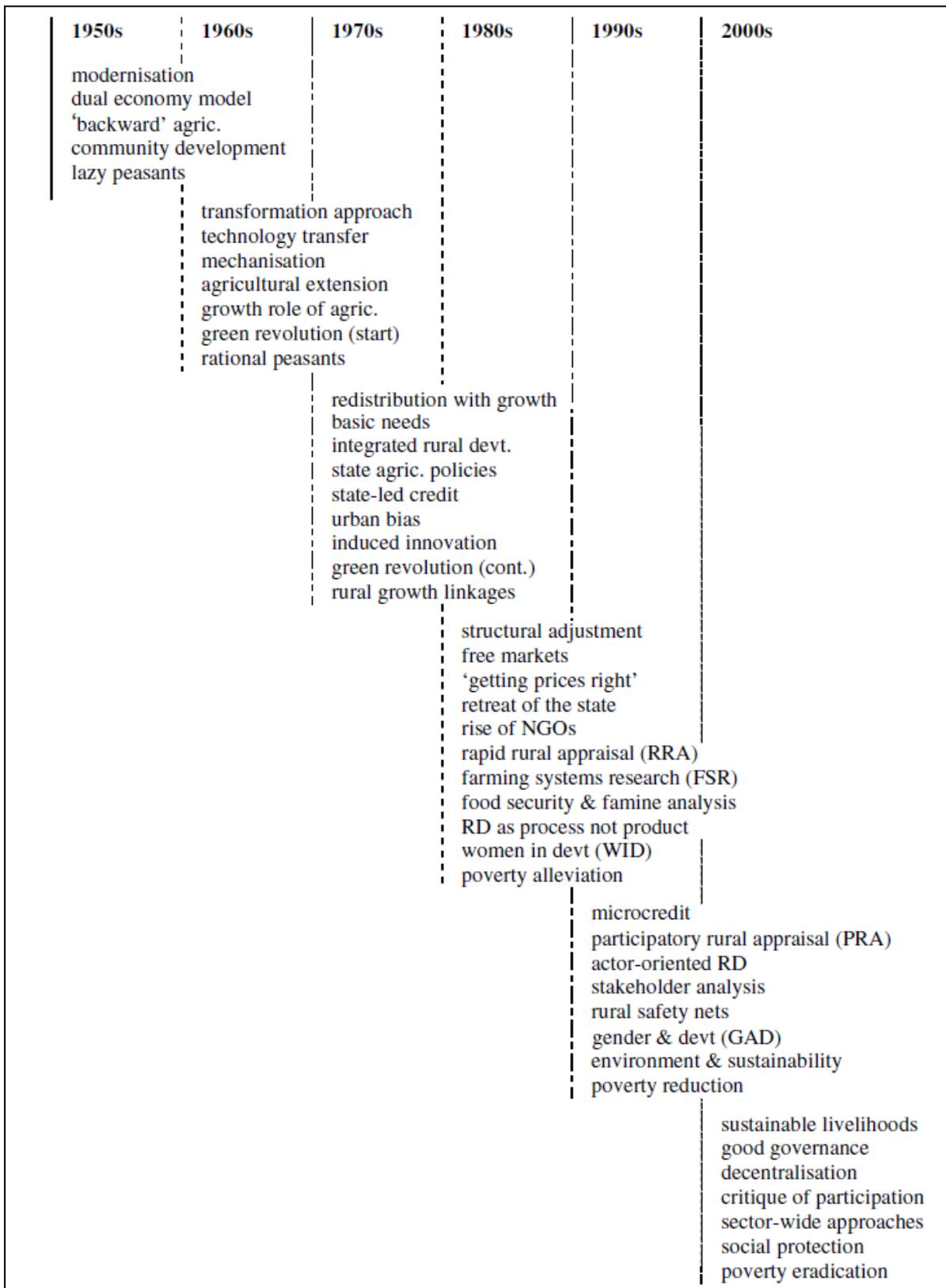
1.1 New perspectives on rural development

Perspectives on rural development have undergone significant changes over the past five decades. Since the 1950s, the so-called ‘modernization paradigm’ was the dominant model: it, focused on bringing benefits at the macro-economic level without adequately taking into account the interests of the rural majority. In the 1990s, an alternative holistic approach emerged: it was more flexible and responsive to the needs of diverse productive groups and sectors of the society, particularly the rural poor. The major switches in rural development thinking can be summarized in the timeline presented in the next page in Figure 1.1.

On the other hand, as argued by several authors, the agricultural sector has been facing major challenges including: global transformations in rural economies and phenomena such as liberalization, interconnectedness, concern for sustainability and protection of ecosystems, as well as the expansion of information and communication infrastructures (see Swanson et al., 1997; Leeuwis, 2004a; Norrish et al., 2007).

Development scholars and practitioners now commonly acknowledge that to achieve sustainable agricultural development, technologies and material inputs (e.g. seeds and fertilizers) are not as central as the people who use them. This focus on human resources and their social capital for rural development implies a greater effort to promote improved knowledge and information sharing, along with the use of appropriate communication methodologies, channels and tools.

Figure 1.1 Rural development ideas timeline



Source: Ellis & Biggs (2001).

In fact, considering the quick evolution of agricultural research and technology development, agriculture is becoming increasingly knowledge and information intensive: 'Farmers and other users of renewable natural resources require access to up-to-date, relevant and reliable information to help them make decisions in a complex set of interacting environments' (Mulhall & Garforth, 2000).

These challenges, in the framework of a new multi-institutional and cross-sector vision of rural development, call for a central role of communication. No longer limited to the linear transfer of technology, as in the conventional 'diffusion of innovation' approach (see Rogers, 1962), communication for development acquires a crucial function in promoting sustainable agriculture and rural livelihood strategies through dynamic networks and knowledge flows that facilitate stakeholders' active participation and ownership.

1.2 Rethinking agricultural extension

The changed approaches to rural development have also been a major cause for the demand of new institutional arrangements for the provision of extension and advisory services. Concurrent with the emergence of a 'market-driven, agribusiness orientation' in extension worldwide (Rivera, 2001:4), governments in developing countries have been adopting structural adjustments, urged to cut public services expenditures: employment in agricultural research and extension (R&E) decreased, as the resources were expected to be claimed by 'progressive' and information-seeking farmers. In addition, the shortcomings of public extension services and the pressure towards participation and good governance have been influential factors that in some contexts set in motion political and institutional reforms (see Farrington, 1995).

These institutional changes have been accompanied by a deep shift in the theory of agricultural extension, oriented towards a gradual reinvention of its mission and societal function. The classic definition of extension as a 'professional communication intervention deployed by an institution to induce change in voluntary behaviours with a presumed public or collective utility' (Röling, 1988:49), has been rethought. Nowadays 'extension' conveys a different meaning, in line with participatory perspectives that promote a less vertical and paternalistic approach to promote the empowerment of the poorest. The research-extension continuum has been altered and a more explicit role is being given to communication for development as a technical field of expertise.

Traditionally, 'agricultural research is seen as the fountainhead of technological innovations, and extension delivers them to farmers' (Röling, 1995:1). In actual fact, extension services – generic and often 'elite-biased' – were often included as a complementary input of the state 'package' supplied to farmers, together with seeds and fertilizers. The methodologies used, such as training and visit (T&V), were designed to create a unidirectional information flow, meant to transfer technical knowledge and skills to the prospective adopters of new technologies.

Later conceptualizations shifted towards a less top-down view, where specialists visited the field plots with the general purpose of improving their clients' productivity. For instance, Van den Ban and Hawkins (1996:9) articulated the following definition: 'Extension involves the conscious use of communication of information to help people form sound opinions and make good decisions.' However, even when intended as a support to farmers' decision making and problem solving abilities, within the framework of a consultative model of advisory work, public extension was often characterised by a rather mechanical delivery of messages and a general lack of feedback mechanisms.

In 1995 Röling argued that a third alternative model was emerging beside the two usual patterns of extension, intended as transfer of technology (ToT) or consultancy: this was the facilitatory extension approach. Table 1.1 below provides a visual summary of their defining features:

Table 1.1 Characteristics of different extension approaches (according to Röling)

<i>Nature of</i>	LINEAR ToT	CONSULTATIVE	FACILITATORY
INNOVATION	Competent Techs Commodity	Tech/Market/Org optimize decisions	Eco-system manage/principles
LEARNING	Aware → Adopt from outside	Improve problem solving	Discovery and experimentation
EXTENSION	Transfer via demos, field days	Advisory/Request Specialist	Participatory learning
INSTITUTION	Science – Practice continuum	Mobile experts networks	Networks of mobile facilitators
POLICY	Large public investment	Stimulate business market	Funding horizontal networks

Source: Shepherd (2009).

Later called 'farmer-led' (Scarborough et al., 1997) or 'participatory' extension, the new facilitatory approach was based on participation and on discovery learning, and aimed at enhancing farmers' capacity to 'become researchers, observers and (collective) decision makers' (Röling, 1995:5).

Nowadays, agricultural extension systems have started to include a stronger social focus, and this implies not only a broader range of services, but a widening of the concept itself. Several authors advocate for a more comprehensive 'rural livelihoods extension', able to provide situation-specific information and integrate technical advice with social needs, particularly in support of marginalized and resource-poor farmers (see Farrington et al., 2002). They suggest that agricultural information and communication services have the potential to meet different information needs and 'assist rural people in diversifying their livelihoods to find non-agricultural pathways out of poverty' (Rivera, 2005).

This is the stance taken more recently by FAO and the Global Forum for Rural Advisory Services (GFRAS), in a paper reconsidering extension services in view of the new opportunities and the current challenges facing the farming, agri-food and rural development sector. The study acknowledges the strong demand for reforming extension within a more complex and dynamic set of relationships, starting from the involvement of a wide range of stakeholders and including issues that go beyond technical innovation in agriculture (e.g. food security, nutrition, climate change adaptation). Extension is used as an 'admittedly amorphous umbrella term' for all activities related to the provision of information and advisory services needed and demanded by farmers and other actors in agrifood systems (FAO & GFRAS, 2010:2). All in all, the paper promotes a new and broader perspective on what future extension should look like, emphasising tasks such as improving linkages among different actors, mediating conflicts, brokering, coaching and partnering in local rural development settings and value chains. This again brings to the fore the need for developing sound communication capacities.

In fact, as Leeuwis and Hall (2010:7) argue in a paper prepared for the FAO Research and Extension Branch, in order to make innovation happen, conventional extension tasks - such as information provision, awareness raising, training or persuasive mass media campaigns - 'need to be accompanied by (and embedded in) other communicative strategies and services'. These so called 'innovation intermediary activities' (Howells, 2006:720) include among others: network and knowledge

brokerage, organizing interaction and participation, demand articulation, mediation and process facilitation. In practice, despite the new demands and ways of thinking, institutional structures are often resistant to changes and remain strongly embedded in the old paradigm discourses, socio-economic patterns and technical standards.

1.3 Knowledge and information in Agricultural Innovation Systems

The provision of agricultural information and advice has been ultimately recognized as an endeavour embracing multiple social concerns, and involving a large variety of actors and suppliers. The international debate has reflected the emergence of non-governmental and private service providers in what was traditionally a monolithic institutional setting, exclusively public. Growing attention has been devoted to the wide range of interactions and activities going on in the multi-stakeholder system comprising the so called rural knowledge institutions (agricultural research, extension and communication services) their clients and partners – this is often referred to as ***Agricultural Knowledge and Information System (AKIS)***.

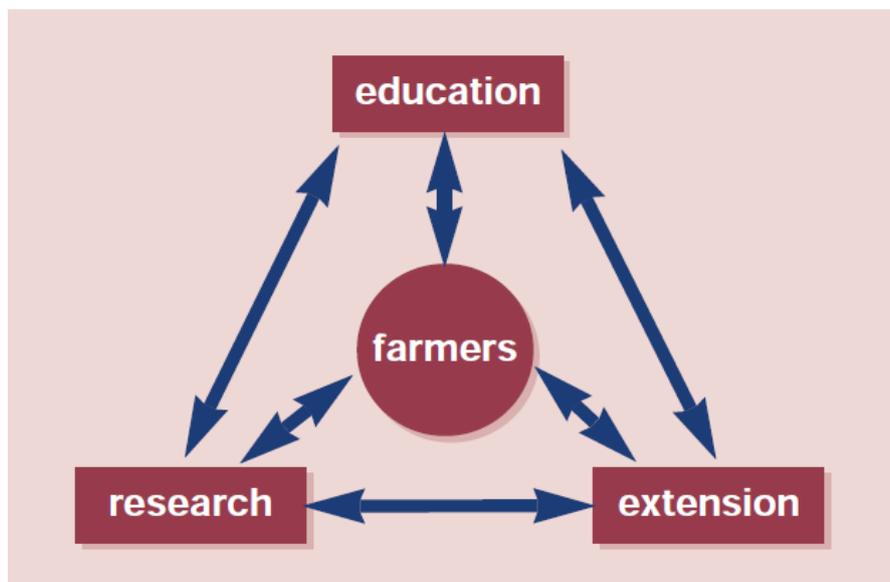
First theorised by the Wageningen scholars Röling and Engel in the late 1980s, the idea of a potentially synergic agricultural knowledge system has been later embraced by various international development agencies. In its original definition the AKIS was described as:

‘a set of agricultural organisations and/or persons, and the links and interactions between them, engaged in such processes as the generation, transformation, transmission, storage, retrieval, integration, diffusion and utilisation of knowledge and information, with the purpose of working synergically to support decision making, problem solving and innovation in a given country’s agriculture or domain thereof.’ (Röling, 1989:1)

The articulation of the AKIS concept can be seen as a turning point in the field of extension, as a way of understanding rural change as essentially knowledge-based (Hirvonen, 2008:15). This settled the ground for the recognition of innovation as an interactive process of knowledge sharing and learning. FAO and the World Bank (2000:2) adopted the concept of ***AKIS for Rural Development (AKIS/RD)*** as an analytical instrument that ‘links people and institutions to promote mutual learning and

generate, share and utilize agriculture-related technology, knowledge and information'. As shown by Figure 1.2, farmers lie at the heart of the knowledge triangle formed by research, education and extension. Functional linkages among institutions and people included in the system occur through two-way communication processes represented by the double arrows.

Figure 1.2 Agricultural Knowledge and Information Systems for Rural Development



Source: FAO & WB (2000)

According to Hartwick et al. (2007:11), the advantage of AKIS is that it encompasses the different actors (users, providers, facilitators) involved along the knowledge generation chain and, despite its concrete application by policy makers has remained 'rather anecdotal', the concept represents a great achievement since it introduces the farmers' perspective and calls attention to 'the understanding of interaction and knowledge flows on a farm and community level' (ibid.).

However, going beyond researchers, educators, extensionists and farmers, the system receives further substantial contributions by other key human components, including farmers' organizations, cooperatives, community workers, universities, public/private sector research, extension or training institutions, agricultural information services, policy makers and businessmen, as well as formal and informal networks. Moreover, the concept of AKIS somehow overlooks the role of markets and the many forms of the private sector along the value chain, as well as the importance of a favourable policy environment.

Consequently, to better understand the AKIS dynamics, these should be enclosed within a more comprehensive framework, more recently developed and commonly referred to as ***Agricultural Innovation System (AIS)***. Table 1.2 below compares key features of both models.

Table 1.2 Defining features of AKIS and AIS frameworks

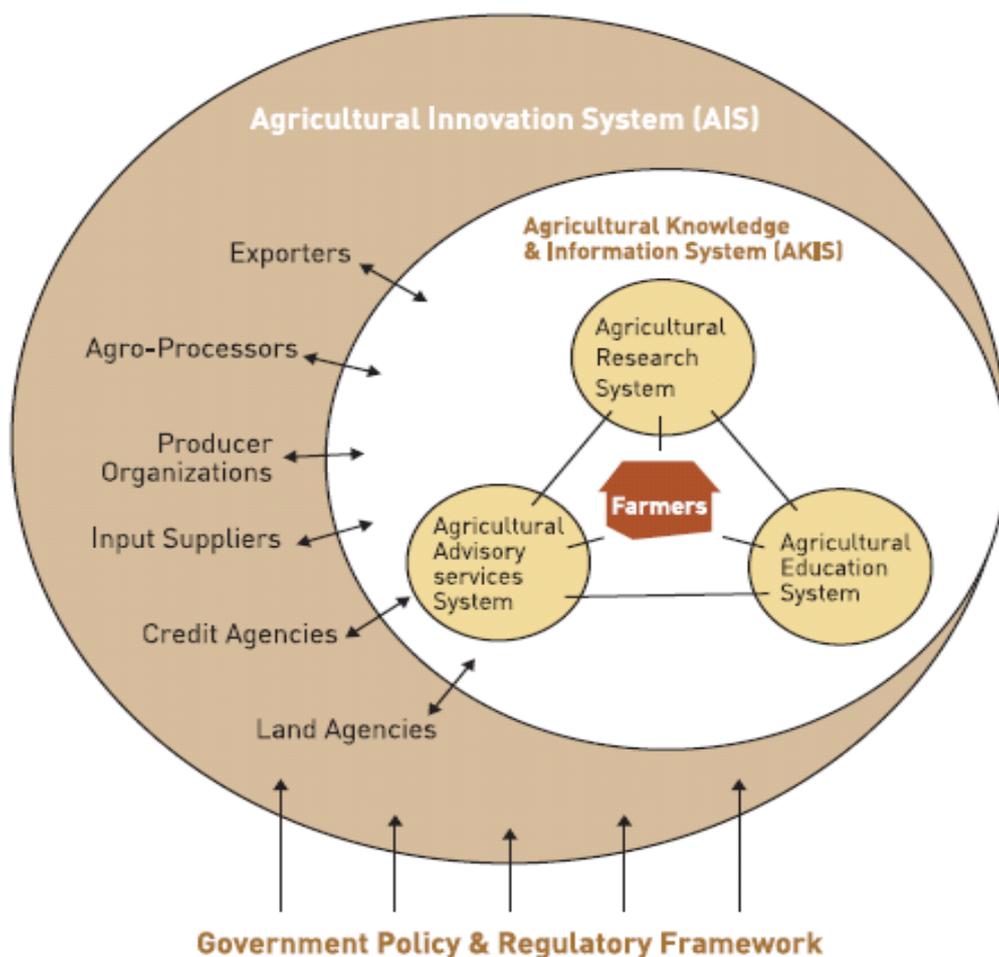
Defining Features	AKIS Agricultural Knowledge and Information System	AIS Agricultural Innovation System
Purpose	Strengthen knowledge generation and sharing through adequate delivery services to people in the rural sector	Strengthen capacities to innovate throughout the agricultural production and marketing system
Actors	National agricultural research organizations, universities or faculties of agriculture, extension services, farmers, NGOs, and rural entrepreneurs	Potentially all public/private actors involved in the creation, diffusion, adaptation, and use of all types of knowledge relevant to agricultural production and marketing
Outcome	Technology adoption and innovation in agricultural production	Combinations of technical and institutional innovations throughout the production, marketing, policy research, and enterprise domains
Organizing principle	Accessing agricultural knowledge	New uses of knowledge for social and economic change
Mechanism for innovation	Interactive learning	Interactive learning
Market integration	Low degree	High degree
Role of policy	Enabling framework	Enabling framework
Capacity strengthening	Strengthening communication between actors in rural areas	Strengthening interactions between actors; institutional development and change to support learning and innovation; creating an enabling environment

Source: Adapted from World Bank (2006:23)

To sum up, an AKIS includes 'all the organizations, individuals and processes involved in the generation and modification of knowledge, and in the acquisition, transmission and exchange of information relating to agriculture' (Garforth, 2001). As illustrated by

Figure 1.3 the AKIS is, in turn, part of the AIS: a broader framework embracing ‘**all sort of actors and practices** that constitute, perform and participate in innovation processes, **their interactions** (learning cycles, networks), **the structures and rules** guiding their actions on a national or sector level.’ (IFPRI, 2007:2)

Figure 1.3 Agricultural Innovation System (AIS)



Source: Birner et al. (2006)

The AIS depicts a network of well connected actors and sub-systems who collaborate in exchanging information, knowledge and ideas, and who share the learning needed to support innovation in the agricultural and rural development sectors. An AIS should be able to address emerging concerns, quickly take up new issues and opportunities, provide services tailored to farmers’ needs, by developing practical ideas to support innovation, knowledge transfer and information exchange. The innovation systems analysis gives an important contribution to a renewed holistic vision of agricultural and rural development, as it acknowledges that creating an enabling environment for rural actors to make innovative uses of knowledge, is just as significant as making that

knowledge available through research and dissemination mechanisms. On the other hand, in recent years the complexity of issues surrounding agriculture (e.g. climate change, food security, the provision of public goods etc) has increased, as has the range of actors engaging in knowledge generation and use. These should also be included in a renewed AIS model.

In conclusion, although they do not provide many operational tools for changing the institutional arrangements to reflect an integrated systemic model, the notions of AKIS and AIS together outline a useful conceptual framework to analyse and describe the complex multi-dimensional settings where rural development processes take place.

1.4 The role of communication for innovation and development

Information and knowledge are core elements to trigger any process of change and development. This is particularly evident in rural areas where a blend of local knowledge and outsider information, derived from formal research or other sources, can create the momentum for agricultural innovation and other change opportunities. For this reason, there is a need for development professionals ‘to bring local and external bodies of knowledge, and local and external processes of research, into a creative dialogue in order to develop new knowledge and resource management strategies.’ (Garforth & Norrish, 2002:5)

Members of rural communities access information from multiple sources including other farmers, traders, input suppliers, NGOs and research institutions. These different actors constitute, according to Ramirez (2005:421), agricultural communication networks which ‘interact regularly in multiple ways to form new relationships for innovation [...] It is the demand capacity of farmers that dictates the quality and effectiveness of the extension support.’

Thereby, moving from this awareness and as a result of rapid evolutions in the field, even senior scholars (see Röling & Wagemakers, 1998) have called for a complete redefinition of the meaning of ‘agricultural extension’ and eventually a disposal of the notion itself. In fact, more recent analyses want to replace the term ‘extension’ with ‘**communication for innovation**’ (Leeuwis, 2004b:27), defined as:

‘a series of embedded communicative interventions that are meant, among others, to develop and/or induce innovations which supposedly help to resolve (usually multi-actor) problematic situations.’

This represents a clear effort to rethink the whole idea of extension, discarding the linear model of ready-made technology and knowledge transfer, as well as the traditional understanding of ‘adoption of innovations’ as something happening at an individual level, without considering the social interactions and exchanges of knowledge. Conversely, innovation can be defined as ‘a collective phenomenon in which social dilemmas and tensions are always likely to come to the fore’ (Koelen and Röling, 1994).

The definition of ‘communication for innovation’ implies a different view of what an ‘innovation’ actually is: a ‘novel pattern of coordination and adjustment between people, technical devices and natural phenomena’, thus a process intrinsically involving many stakeholders with new rules, experiences and social relations (Leeuwis, 2004b:27). Such a radical rethinking of innovation reinforces the need for communication as a key element to be carefully considered and managed. The emphasis shifts from a standard use of communication as a top-down instrument to transfer information and implement policies, towards mediation and the organization of interactions ‘in order to arrive at common starting-points, fitting and acceptable innovations and cogent policies’ (Leeuwis, 2004c:774).

Mulhall and Garforth (2000) also concurred that the conventional ToT paradigm was not relevant nor sustainable because it did not acknowledge the needs of individual farmers and the complexity of farming systems; on the contrary, clients’ participation is what creates a real sense of ownership and self-reliance. The participatory dimension of innovation has been increasingly recognized as a driver of inclusiveness and sustainability that is directly linked to communication processes. As clearly stated by Ramirez and Quarry (2004:4), ‘communication and participation are, in fact, two sides of the same coin.’ This approach, very much in line with the participatory perspective put forward since the late 1980s (see Chambers, 1983; 1997), stresses the role of communication as a tool to support social inclusion, participation, dialogue and exchange of knowledge and information, strategic to ensure that people needs are at the centre of all rural development efforts (Bessette, 2004).

Functions and challenges of rural communication

In rural development and agricultural innovation contexts, communication encompasses various complementary functions. Along with the major traditional functions of information provision and educational communication (making things known through awareness campaigns and training), a third ‘facilitatory’ function characterizes more participatory communication processes, where the communicator acts as a broker of information demands and supplies ensuring the active engagement of stakeholders.

Leeuwis (2004b:29) classifies different kinds of communicative interventions – called ‘**communication for innovation services or strategies**’ - depending on their focus, either on individual farm management or on collective change and coordinated action. He also distinguishes general functions which may be relevant to all kind of communication for innovation service (see Table 1.3):

Table 1.3 General communication functions in innovation systems

FUNCTION	Intervention sub-goal	Role of communication worker	Role of ‘client’
Raising awareness and consciousness	- encouraging people to define a situation as problematic - mobilising interest	- providing feedback - raising questions	- unexpected receiver or relatively passive participant
Exploring views and issues	- identifying relevant views and issues	- stimulating people to talk - active listening - active learning	- source of information - active participant/ learner
Information provision	- making information accessible to those who search for it	- translating and structuring information	- active learner
Training	- transferring and/or fostering particular knowledge, skills and abilities	- educator/trainer	- student

Source: Leeuwis (2004b:31).

FAO’s pioneering *Guidelines on Communication for Rural Development* in 1989 already called for ‘the conscious and active participation of the intended beneficiaries at every stage of the development process’. This participatory approach, commonly referred to as **Communication for Development (ComDev)**, puts rural people at the

centre of any development initiative or intervention: planners, development workers, local authorities and community members are considered as communication peers, equally committed to mutual understanding and concerted action. A widely adopted definition, result of a world congress organized by FAO and the World Bank in 2006, describes Communication for Development as a 'social process based on dialogue':

'ComDev is about seeking change at different levels including listening, establishing trust, sharing knowledge and skills, building policies, debating and learning for sustained and meaningful change'. (The Rome Consensus, 2006:2)

This later conceptualization is useful to understand the value added of communication in innovation, as it highlights its specific facilitation function that is central in an integrated system perspective. In order to create a favourable environment for innovation, thus to achieve a right combination of technical, institutional and social change, an important precondition is that all different players can dialogue to express their needs, negotiate their priorities, share their knowledge and strengthen their linkages. Communication services are therefore vital to organize such interactions and facilitate network building, social learning and conflict management (Leeuwis, 2004a;b;c). This is the role of communication in the pluralistic rural context described by AIS, where negotiation and coordinated action are at the core of sustainable change.

FAO has a long-lasting experience in applying communication for development methodologies to sustain rural livelihoods. Since the 1980s it has been providing technical assistance to national and local rural institutions in developing countries to formulate communication strategies and systematically implement communication activities to improve participation, knowledge and information sharing, research-farmers linkages and in general networking and collaborative change. Communication is considered as a key ingredient to foster multidisciplinary and multi-stakeholder action for adaptive livelihoods and sustainable rural development, used 'to meet people's knowledge and information needs and to strengthen development institutions to better serve rural communities' (FAO, 2009b). To this end, participatory communication methods, techniques and tools are applied, ranging from rural radios to modern ICTs.

Nowadays FAO ComDev field projects address social and agricultural innovation but also emerging themes such as climate change adaptation, food and nutrition security, disaster risk reduction. For instance the FAO *Communication for Sustainable*

Development Initiative (hereinafter referred to as CSDI) is an interregional programme currently promoting and field-testing the ComDev approach to improve small farmers' livelihoods and particularly to address the impact of climate change on natural resource management and food security. In the framework of this multidisciplinary community-based approach, rural communication services are provided as interactive communication processes, aimed at meeting the knowledge and information needs of local stakeholders in the most diverse agro-ecological, socio-economic and institutional contexts. **Rural communication services (RCS)** are intended as a public good, meant to enhance rural livelihoods by facilitating equitable access to knowledge and information, promoting social inclusion in decision-making and stronger links between research institutions and local communities' knowledge (CSDI, 2010:33).

Among the major challenges faced by communication for development in rural areas are (Del Castello and Braun, 2006:5):

- dearth of information (absence of providers or local communication content);
- conflicting messages (difficult to know what is relevant/correct information);
- fragmented market for information with many individual clients or client groups;
- relatively few clients scattered over a large area;
- structural transformations leading to constantly changing channels and content;
- lack of the necessary skills for communication;
- lack of well-developed ICT infrastructure and low levels of ICT skills.

In the face of this situation, the role of national governments becomes particularly critical because pluralistic and decentralized services require coordination and dialogue to address change (The Neuchâtel Group, 1999). However, the need for a legal and institutional framework wherein multiple actors can provide communication services, does not necessarily mean that governments are the ones called to manage or control the system.

1.5 Governance in Agricultural Innovation Systems

A vast body of literature has focused on the role of governments in the provision of agricultural information and advice (see Swanson, 1997; Rivera, 2001; Chapman & Tripp, 2003; IFPRI, 2007). While central governments were traditionally responsible for both funding and delivery of extension, recent trends in theory and practice, in relation

with the 'commodification' of agricultural knowledge and information, have questioned the nature of extension in itself as a public service. According to Rivera (2008:101), two 'pathways' can be distinguished in the reform of public agricultural extension:

- a. capitalistic attitude towards agriculture as business, calling for demand-led services; and
- b. democratization and empowerment drives in development, pushing towards farmers' association and participation in extension decision-making processes.

Highly differentiated rural economies create diverse information needs, and the gradual decline of state interventions faces a widespread tendency towards pluralism, with many more actors from the non-governmental and commercial sector participating on the supply side of extension. Rivera's analysis concludes that 'what is needed is not 'pluralism' per se but rather a multipurpose pluralism aimed at clear-cut public, private and non-governmental programs and services for the different demands of development.'

Narrowing down to developing countries, one could say that public involvement in strategic planning and policy implementation for rural development is quite problematic. Governments usually attempt to foster agricultural innovation through R&E programmes, funding facilities or subsidies to private-sector and farm activities; nonetheless, public interventions are hardly effective in complex multi-stakeholders innovation processes, and are likely to end up supporting and managing only the public research and extension organizations that directly depend upon them.

It can be concluded, quoting Hartwick et al. (2007: vi), that 'governance in innovation systems is less about executing research and administering extension services, and has more to do with guiding diverse actors involved in complex innovation processes through the rules and incentives that foster the creation, application, and diffusion of knowledge and technologies.'

The contribution of the AIS framework to manage innovation in rural areas requires new governance approaches and regulations. Policy needs to reflect the manner in which innovation actually occurs today: often through diffuse networks of actors who are not necessarily focused on traditional research and development (Poppe, 2011).

1.6 Institutionalization as a multidimensional process of change

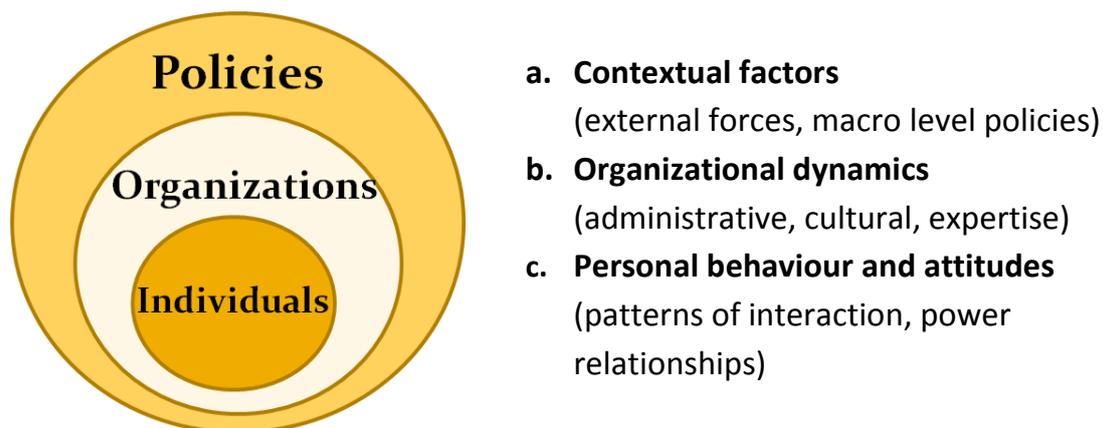
The term 'institutionalization' is widely used in social theory to denote the process of 'making something become embedded within a structured and usually well-established system' (The American Heritage Dictionary, 2000) the latter being an organization, a social system, or the broader society.

Literature on institutionalization of participatory approaches in development (see Blackburn & Holland, 1998; IIRR, 2000; Gundel et al., 2001) presents the concept often associated with that of going to scale. However, although closely related to institutionalization, 'scaling out' or 'scaling up' are definitely different. More specifically, spreading or scaling up changes from the micro (e.g. project / local) to the macro (e.g. policy / national) level, whereas scaling out moves from a single line department, sector or initiative, to catalyse wider changes in both organisations (e.g. government and donor agencies, NGOs, civil society groups and federations, private corporations) and policy processes. Both these terms denote the broader notion of 'reaching more people more quickly', either by expanding the geographical coverage and/or increasing the amount of cases, or by upgrading to involve higher organizational levels. As a result, although scaling up can be a necessary step towards institutionalization, 'a project can manage to reach into several levels of an institution, yet still not ensure that work at these various levels continues after a project has ended' (van Veldhuizen et al., 2002).

Sustainability and capacity-building are thus two key issues that have to be taken into account. Moreover, as suggested by Pimbert (2004), in the rush to scale-up one risks not having real shifts in power relations. On the contrary, it is particularly evident if we look at rural communication and advisory services that the change from dissemination to facilitation requires staff to acquire totally different attitudes, skills and knowledge.

All these factors call for a more comprehensive understanding of institutionalization as a 'social learning' process (Leeuwis, 2002), where decision-making is influenced by social interaction at the policy, organizational and individual levels (see Figure 1.4 in the next page).

Figure 1.4 Layers of the institutionalization process



Source: Author.

The dynamics of institutionalizing participatory and people-centred approaches imply long-term and sustained change, which in turn recognises the conflict between different sets of interests, values, agendas and coalitions of power. Chambers (1998:xi) wrote that in order to reach sustainable participation in development, change is needed in three domains:

- institutional cultures (horizontal structures in governments, donors, NGOs);
- methods and procedures (new skills and competencies through training);
- individual attitudes (non-dominating behaviour and 'disempowerment', redistribution of power from the elites - or experts - to farmers).

Therefore, the potential of participatory communication services to be institutionalized in the wider national framework of agricultural innovation and rural development policies is likely to depend not only on the availability of an enabling policy environment, but also on the capacity to implement these mechanisms at the organizational and individual level.

Chapter IV of this document discusses FAO's efforts to institutionalize communication services in Bolivia, looking at the interconnection of these multiple domains.

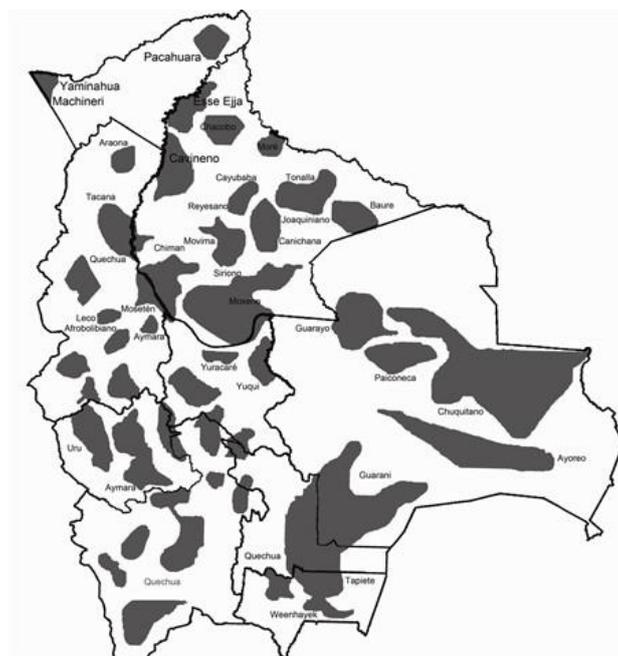
II – The Bolivian Agricultural Innovation System

Bolivia has experienced over time different institutional models of research, extension and advisory services, determined by different rural policies that in turn reflected different ideological perspectives on development. The National Development Plan lately reintroduced the idea of agricultural information as a public good that has to be accessible through free, public extension and communication services.

2.1 Rural livelihoods in Bolivia

Bolivia in 2008 had a population of 9.7 millions and, despite an extensive rural exodus, still the largest rural population (34.4 percent) compared to other Latin American countries (IFAD, 2010). The number of people living below the poverty line can be as high as 90 percent in some rural areas, compared to a national average of 62 percent². Furthermore, a 0.6 Gini coefficient of income distribution illustrates patterns of persistent inequality, with 10 percent of the population obtaining over 40 percent of the total income (WB, 2008). Almost 40 indigenous groups with different languages and cultural identities make up 60 percent of population, while the rest are *mestizos* (mixed American/European) or white descendants.

Figure 2.1 Indigenous people distribution (FAN Bolivia)

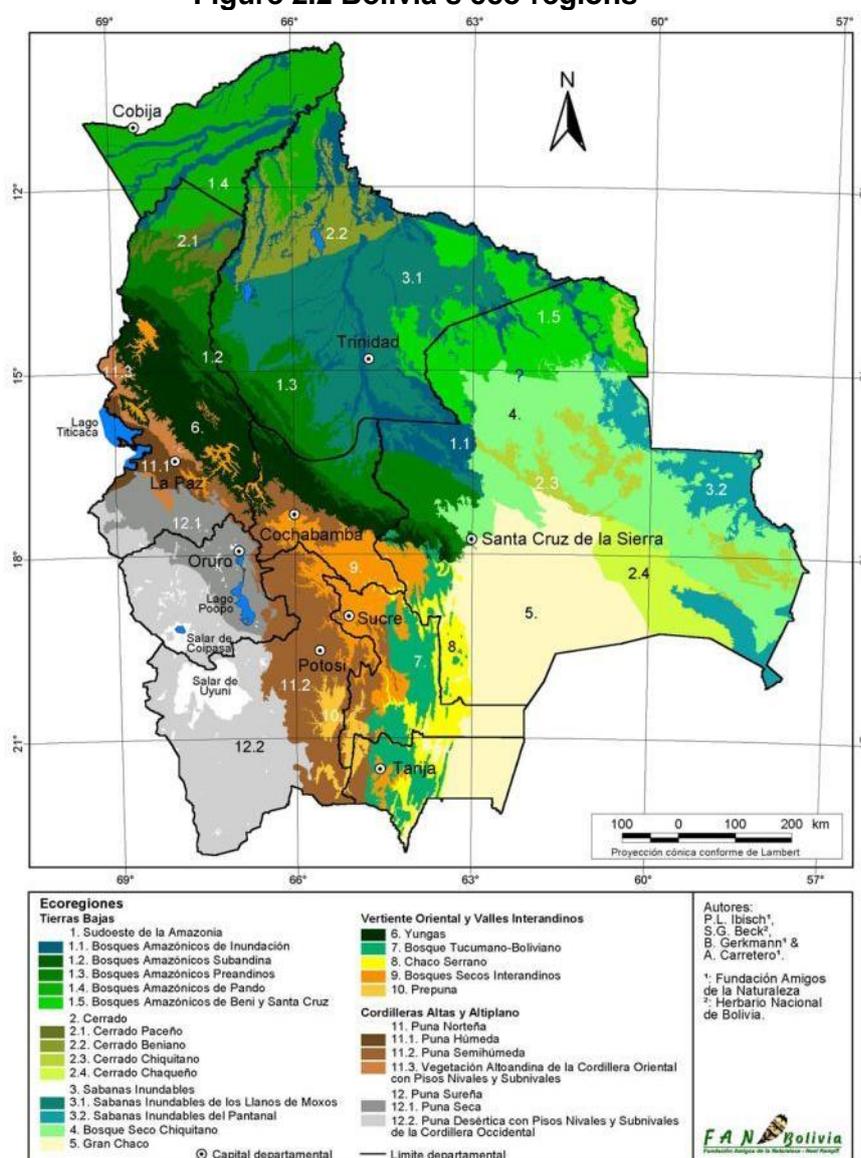


Source: (FAN Bolivia).

² Data referring to 2004 (UNDP, 2007).

The ethnic and cultural heterogeneity is only one dimension of a strongly compartmentalized society, legacy of historical asymmetry in access to, and distribution of resources. Urban elites, mostly of Spanish origin, traditionally dominated the political life and controlled a narrow-based extractive economy (silver in 16th-19th centuries, tin in 20th century and natural gas until recent times), whereas most Bolivians actually are low-income subsistence farmers, miners, artisans or small traders. Although average yields and productivity are among the lowest in Latin America, particularly for staple crops, the agriculture and livestock sector still contributes 15.8 percent of the Bolivian GDP³. The national territory presents one of the world's richest topography and biodiversity, as shown below:

Figure 2.2 Bolivia's eco-regions



Source: (FAN Bolivia).

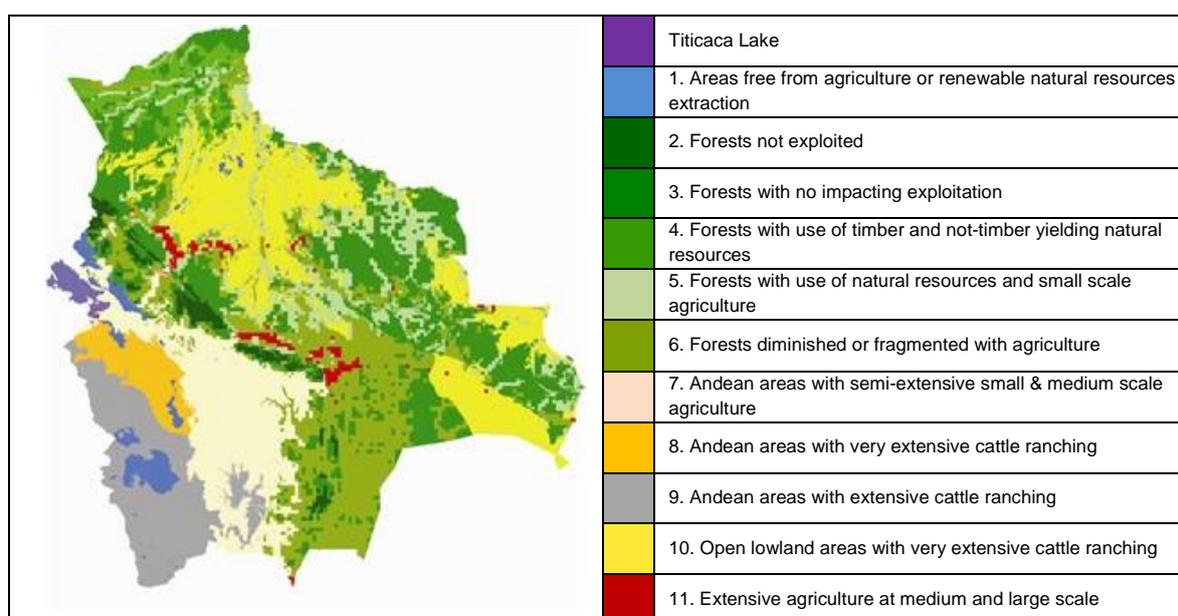
³ Data referring to the period 2000-2005 (UDAPE, 2006).

The Bolivian territory is therefore commonly categorised into three macro eco-regions:

1. Andes and High Plateau or *Altiplano*
2. Inter-Andean Valleys
3. Tropical and Subtropical Lowlands (Amazon, Santa Cruz, Chaco)

Such a huge variety of eco-agrosystems means also a high fragmentation of farming and land-tenure schemes (Bojanic, 2001:4). For instance, encouraged by the high returns for cash crops, agriculture has expanded considerably in the lowlands, but very little in the valleys and the *Altiplano*. Here the economy is based on small-holding or common land ownership with mainly subsistence production, whereas in the lowlands, especially the richest eastern province of Santa Cruz, an export-oriented agro-business economy with extensive livestock systems prevails.

Figure 2.3 Bolivia's land use (FAN Bolivia)



Source: (FAN Bolivia).

Extensive agriculture has a negative impact on natural resources: high deforestation, soil erosion and watershed deterioration. Furthermore, Bolivia's forestry sector is heavily based on resource exploitation: the country's 41 million hectares in permanent forest face deforestation at rates of over 250,000 ha per year (WB, 2008). On the other hand, non-farming sectors such as commerce, education or construction are not largely developed in rural areas, with an average of 83 percent of rural households basing their income on farming and livestock activities (Ministerio de Desarrollo Rural, Agropecuario y Medio Ambiente, 2007).

In the last decades, the weakening of traditional agrarian institutions and low productivity have pushed large numbers of people to the cities, where migrants from rural areas find new livelihoods in commerce, transport, food sale, artisanal activities, the construction sector and the informal economy (Balderrama et al., 2011:10). Interestingly, both rural-urban and rural-rural patterns of migration take place to escape poverty (Bojanic, 2001:3). The latest are mostly directed to the eastern lowlands, and produce growing groups of landless farmers and seasonal workers (mostly indigenous) without regular income. Rural poverty rates are thus higher in the highlands and valleys, where the most vulnerable communities live, but also indigenous people in the lowlands are exposed to indigence and food insecurity.

2.2 National policies for rural development

Innovation processes are embedded and influenced by the wider institutional and policy context. Bolivian public policies for rural development have determined the agricultural R&E systems enforced by governments, reflecting over time different ideological perspectives on development. The neoliberal model, introduced in 1986, over two decades reduced the government role to regulatory functions benefitting the private sector: mainly large-scale and export-oriented farmers were supported, with little or no incentives to small traditional farmers.

Decentralization and Popular Participation Law

A turning point in the Bolivian state structure was the introduction, in 1994, of the Popular Participation Law (PPL). As part of a decentralization strategy, the government devolved funds and authority to local municipalities, turning over to them the responsibility to plan and administrate local development with a formal system of citizen participation in planning and oversight of the use of public resources. This included planning for agriculture and management of natural resources for sustainable rural development (Ramirez & Fernandez, 2007:21). The law recognized grass-roots organizations and traditional/indigenous authorities under the new label of OTBs (*Organizaciones Territoriales de Base*) and officially involved them in co-managing and monitoring the allocation of PPL resources.

This formal mechanism for bottom-up planning at the local level, concurrent with the privatization of agricultural and NRM services, gave municipalities and departmental

authorities additional tasks that were previously carried out by central government agencies. The lack of trained staff called for significant investments in human resource development, and for substantial changes in the roles of all stakeholders involved in rural development. Moreover, at the operational level, coordination between the policies and programmes promoted at the central level, by municipal governments and by international cooperation agencies, implied a great deal of negotiation to achieve joint investments (Balderrama 2011:34).

Initially local participatory planning was infrastructure-biased and rarely included extension and communication activities as part of the rural development plans. It took years and external encouragement for municipalities to allocate part of the PPL budgets in support of agricultural production and technical assistance, particularly because the generation and transfer of technical knowledge in this area was traditionally considered a central or meso-government responsibility (Bojanic, 2001:13).

A new policy framework

The elections of 2005 marked an unprecedented shift in the political history of Bolivia. Evo Morales took office as the first ever indigenous president of Bolivia hoisting the flag of social participation and inclusion of indigenous identity (with him the social movements gained access to political power). The structure and functions of the state were redesigned by a radical political reform that has its major expression in the new multicultural constitution, approved in a referendum in January 2009. The *National Development Plan* (PND) presented by the government asserts the central role of the state to dismantle colonialism and neo-liberalism for a more democratic and egalitarian society, and is based on the principles of: diversification of rural economies, redistribution of resources, social participation, collective production and sharing of knowledge (Ministerio de Planificación del Desarrollo, 2006). This general strategy includes a sector *Plan para la Revolución Rural, Agraria y Forestal* that prioritizes the needs of indigenous rural communities and subsistence farmers (MDRAyMA, 2007).

The new rural policy, informed by a comprehensive vision of multidimensional and integrated development, calls for a reversed trend in public investments in agriculture, with a reshaping of the institutional framework for research and advisory services. The declared purpose is to strengthen the whole system of rural actors through 'participatory, inclusive and democratic processes' of development, change management and evaluation, to achieve the following objectives:

1. advancing towards food security and sovereignty ⁴;
2. extending the contribution of agricultural, livestock and forestry production to people livelihoods and the country's development;
3. promoting sustainable natural resources management (MDRAyMA, 2007).

The above-mentioned participatory processes certainly require giving special attention to the provision of information and communication services in rural areas.

With the government claiming a revolutionary process of change in favour of the most vulnerable sectors of the population, policies for land redistribution, rural development and social inclusion acquire a strong political and ideological connotation. These issues become quite critical, especially with the struggle for autonomy in the resource-rich lowland departments, where state control is seen as the only way to bypass adversely politicized local administrations and reach marginalized farmers through their grass-root organizations.

The new development policies include an operational plan to strengthen the so called 'strategic institutions'. The declared objective is to create a centralized public system led by the '*gobierno dinamizador*', a dynamic force able to foster effective linkages among rural agents, public bodies, private sector and producer organizations. At the same time, the state has the political mandate to directly provide fundamental and applied research, technology transfer and 'free and universal' technical advice, through the coordination of rural extension, information diffusion and communication for development mechanisms (MDRAyMA, 2007).

2.3 Evolution of the institutional framework for rural extension

Rural knowledge institutions in Bolivia have experienced a particularly discontinuous evolutionary process. Different institutional models of research, extension and advisory systems have been put in place; eventually, as a result of past poor performances, since the 1990s there was no national extension system in place in Bolivia and most

⁴ 'Food sovereignty' is a political concept introduced by the international peasants movement *Via Campesina*, during the World Food Summit of FAO held in Rome in 1996, and advocated by a number of farmers, rural youth, women, indigenous peoples and environmental organizations. It refers to the right of each country to define its own policy framework for food, agriculture, livestock and fisheries systems, according to national objectives of sustainable development and food security, protecting domestic markets instead of being subjects to international market forces (Delgado & Escobar, 2009:26).

agricultural communicative interventions depended for many years mainly on NGOs, internationally funded projects or private companies. In fact, research and extension services have long represented a low priority for the Bolivian state, as shown by the modest percentage of public agricultural investment in this area: only 3 percent between 1996 and 2008 (Peres and Medeiros, 2011). Table 2.1 summarizes the evolution of extension services in the Bolivian AIS, parallel to changing ideologies and patterns of rural development:

Table 2.1 Institutional frameworks for rural extension/ advisory services

RURAL DEVELOPMENT MODELS	EXTENSION & ADVISORY SERVICES MODELS
<p>1. Nation State Model (1953-1985) Major support to big commercial activities; crops diversification to substitute import; attribution of small pieces of land to peasants.</p>	<p>a. Classic Extension Service Model (1950s) Inter-American Agricultural Service (SAI)</p> <p>b. Conventional Institute Model (1975) Separate R&E units: Bolivian Institute of Agricultural Technology (IBTA) + Centro de Investigación Agrícola Tropical (CIAT) covering independently the Santa Cruz region.</p>
<p>2. Neoliberal Model (1986-2005) Role of government limited to normative functions; privatization of public services; support to private sector in agriculture and forestry, particularly in the Eastern regions to foster agro-businesses for export; decentralization of services to the municipal level.</p>	<p>a. Technology Supply Focus WB (1990s) 'Progressive Farmers' approach promoting research and entrepreneurship among farmers. Closure of all extension programmes.</p> <p>b. Intermediate User Model in CIAT (1990s) Use of informal contacts as intermediaries to establish a formal two-way flow of technical information with producers. Participatory research centres involving farmers and municipalities.</p> <p>c. Privatized Demand-led Extension (2000) Bolivian Agricultural Technology System (SIBTA) based on 4 eco-regional foundations acting as knowledge brokers between farmers' associations and public/private service providers.</p>
<p>3. Rural Revolution Model (today) Diversification of rural economy; centralized development planning and implementation; emphasis on small farmers and indigenous communities; direct transfer of funds to CBOs.</p>	<p>a. Free Public Extension and Advisory Services (2009) National Institute for Innovation in Agriculture, Livestock and Forestry (INIAF): public system integrating research, technology transfer, technical advice, extension and communication for development.</p>

Source: Author.

SAI: classic extension model

The first attempt to establish a coordinated mechanism for the institutional provision of agricultural information, dates back to the creation of the US funded **Inter-American Agricultural Service** (*Servicio Agrícola Inter-Americano*, SAI) in 1948.

The SAI consisted of a series of experimental research stations working in coordination and a specialized centre: their task was delivering research findings to farmers through the conventional pipeline scheme using top-down methods. The SAI extension service was the launch pad for professionals like Mario Villaroel, Jaime Cusicanqui and Ramiro Beltrán, who would later become the most renowned Bolivian rural communication specialists.

BOX 2.1 Pioneering experiences of communication for rural development

Luis Ramiro Beltrán is internationally well-known as the prime theorist of the Latin American School of Communication, who challenged the so called 'dominant paradigm' by advocating the democratization of social communication. He started his career in 1953, recruited as a young journalist by the SAI Agricultural Information Unit.

According to Beltrán, the task of SAI communicators was not only to design printed and radio materials to disseminate messages about pesticides, new crops varieties, soil management, etc. but also providing extension workers all over the country with attractive tools in support of their interpersonal communication, during field and household visits. Rural communication was mostly intended as an exercise of informal education by Beltrán and colleagues, who also designed and set up an itinerant puppet theatre whose characters talked to rural public in both Spanish and indigenous language. Graphic and audiovisual supports such as flip charts and photos, slides, 8 mm films were used as educational instruments, and despite the SAI communicative interventions were not yet research-informed nor monitored or evaluated, they revealed a germ of planning attitude in communication pro rural development.

Source: L. R. Beltrán, personal communication (June 17, 2009).

IBTA: conventional state institute model

SAI activities ended in the mid-1960s, when budgetary constraints made many of the best-qualified researchers leave and the infrastructure began to deteriorate (Godoy et al., 1993). It was later replaced in 1975 by the **Bolivian Institute of Agricultural Technology**, (*Instituto Boliviano de Tecnología Agrícola*, IBTA). Extension and

Research services were provided for the whole country except the Santa Cruz region in the lowlands, which was covered by an independent agricultural research centre, named ***Centro de Investigación Agrícola Tropical*** (CIAT).

IBTA followed and consolidated the conventional approach of knowledge generation and technology transfer along a vertical chain, based on the assumption that researchers will hand down their results to extensionists, who will then diffuse these to farmers. The set up of separated Research and Extension units also responded to the hierarchical model of national agricultural research systems (NARS)⁵ existing in Latin America. Thus, the working methods were similar to those of the SAI period, but the activities were mainly conducted by junior researchers and extensionists located in key farming areas (Bojanic, 2001:7).

Major weaknesses of the system were the strong centralism and government control, and the attempt to impose a one-size-fits-all model of extensive agriculture, in line with the Green Revolution, in Bolivia's highly diverse agro-ecological and productive areas. The lack of farmers' involvement and the scarce value given to traditional indigenous knowledge were thus significant failures of this system. In the mid-1980s, political and budgetary pressures led both IBTA and CIAT to cut their funds and reduce the number of extensionists, eventually leaving the Santa Cruz region with no public extension service at all from 1987 onwards (Thiele et al., 1998).

WB project: 'progressive farmer' model

In the early 1990s all IBTA extension offices were closed. Concurrent with the Institute crisis, a WB project introduced a new scheme focused on the supply of technologies, assuming that farmers by themselves would search for and adopt them. This way of promoting innovation and entrepreneurship among farmers is commonly indicated as the 'progressive farmer' approach: it ends up targeting a tiny group of farmers with enough land, labour and financial resources to follow the project recommendations, while neglecting the vast majority of small subsistence farmers.

⁵ The national agricultural research system (NARS) model implies that all research related to agriculture in a country forms a hierarchical system, administered through a coordinating governmental body. Although closely related to the NARS, extension and technology transfer agencies are not included and have often been dominated by national agricultural research institutes (NARIs; INIAs in Spanish) which tended to receive the main share of government and donor funding (IFPRI, 2007: 10).

Meanwhile, CIAT researchers experimented with the 'Intermediate User' method, using selected contact groups (NGOs extensionists, producers associations, suppliers of agricultural inputs) as intermediaries to establish a formal two-way flow of technical information with producers and farmers in a given area. A department for Technology Transfer and Communication was created to enhance linkages and coordination with the Intermediate Users, and to foster the production and dissemination of technical information through mass media. Afterwards, to increase farmers' involvement in planning, design, implementation and evaluation of on-farm trials, CIAT launched community-based participatory research centres – *Centros de Investigación Agrícola Comunal* – involving farmers and selected municipalities (Bojanic, 2001:10).

The only R&E programme that survived IBTA's final closure in 1997, thanks to Swiss financial support, was the Foundation for Research and Promotion of Andean Crops (PROINPA) that, together with CIAT in the eastern lowlands, led extension efforts for many years in the institutional vacuum left by the Bolivian public service.

SIBTA: privatized demand-led extension model

In 2000 a new ***Bolivian Agricultural Technology System*** (*Sistema Boliviano de Tecnología Agrícola*, SIBTA) was established. It operated through four Foundations for Agricultural Technology Development (FDTA) in the main agro-ecological regions of the country: Andean Highlands, Valleys, Humid Tropics and Chaco.

Agricultural innovation projects were proposed by farmers associations, standardized by foundations, and developed by public/private service providers competing to execute them; foundations thus acted as brokers, organizing a market between the demand for agricultural technology by farmers' associations, and the supply of advisory services by public/private providers.

In line with the neoliberal shift of Bolivian rural policies, the SIBTA was designed to blend the public service with an extensive participation of the private sector, in order to foster demand-led and market-oriented agricultural innovation: about 70 percent of SIBTA members were private organizations, such as farmers unions or producer organizations, while 30 percent were public institutions like for instance municipalities and universities (Jansen, 2006:30).

Therefore, the governance of SIBTA was characterized by:

- decentralized funding, technical and administrative autonomy;
- systemic approach to agricultural innovation, technology generation and management;
- outsourcing of research and technology transfer activities to local knowledge providers, consultants, NGOs, private firms and independent research organizations;
- free market bidding and competition for both producers and research centres;
- co-financing rule (15 percent funding counterpart required by farmers);
- monitoring and evaluation through government and donor institutions.

The SIBTA intended to demonstrate that the orientation to farmers' demand leads to better service delivery and technology adoption. Nonetheless, the system had its structural and methodological limitations related to the privatization of knowledge and to a *de facto* exclusion of public institutions from what was assumed to be a competitive market for research and extension services. The most evident shortcoming was the fact that the majority of the rural population, subsistence and small-scale farmers with little or no orientation to market, were practically excluded, due to scarce financial capacity and low education and technology levels.

On the methodological side, a major weakness was often the top-down Transfer of Technology (ToT) approach: this meant major investments in acquiring external technologies and best practices from other countries, rather than in the development of locally relevant ones. With little interaction with research centres and universities, the SIBTA focused on transferring the technology package directly to producers, treating them as passive receivers. According to an impact evaluation (Lema et al., 2006), despite some positive general outcomes obtained by the SIBTA⁶, producers' participation in project planning was very weak in 66 percent of cases, in 62 percent the demand was induced by service providers and in 40 percent there were very low benefits for vulnerable groups. Furthermore, the SIBTA bidding process and its structure based on outsourcing to independent foundations, increased transaction and bureaucratic costs, and ended up by hindering the system's efficiency due to a dispersion of administrative efforts (C. Ayala⁷, personal communication, June 9, 2009).

⁶ Client satisfaction with the projects outcomes (79%) and with service suppliers (80%); increased income (79%); neutral impact on the environment (90%); capacity building (60%). Data referring to 24 PITAs – Applied Technology Innovation Plans – selected by macro eco-region (Lema et al., 2006).

⁷ Director of INIAF headquarters Research and Innovation Division.

Such limitations, together with the major political changes introduced by the first government of the president Evo Morales in 2006, led to the scrapping of SIBTA and the establishment of a new institutional agent in the agricultural innovation system: the National Institute for Innovation in Agriculture, Livestock and Forestry (INIAF).

III – INIAF: Towards a public and decentralized service for agricultural innovation

INIAF's institutional mandate is to create effective linkages among all different system stakeholders, at national and local level, and to become a catalyst for agricultural innovation. To this end, communication emerges as a strategic asset to ensure access to information and to enable two-way knowledge exchanges between different actors, which are functional to consolidate networks and encourage an associative innovation culture.

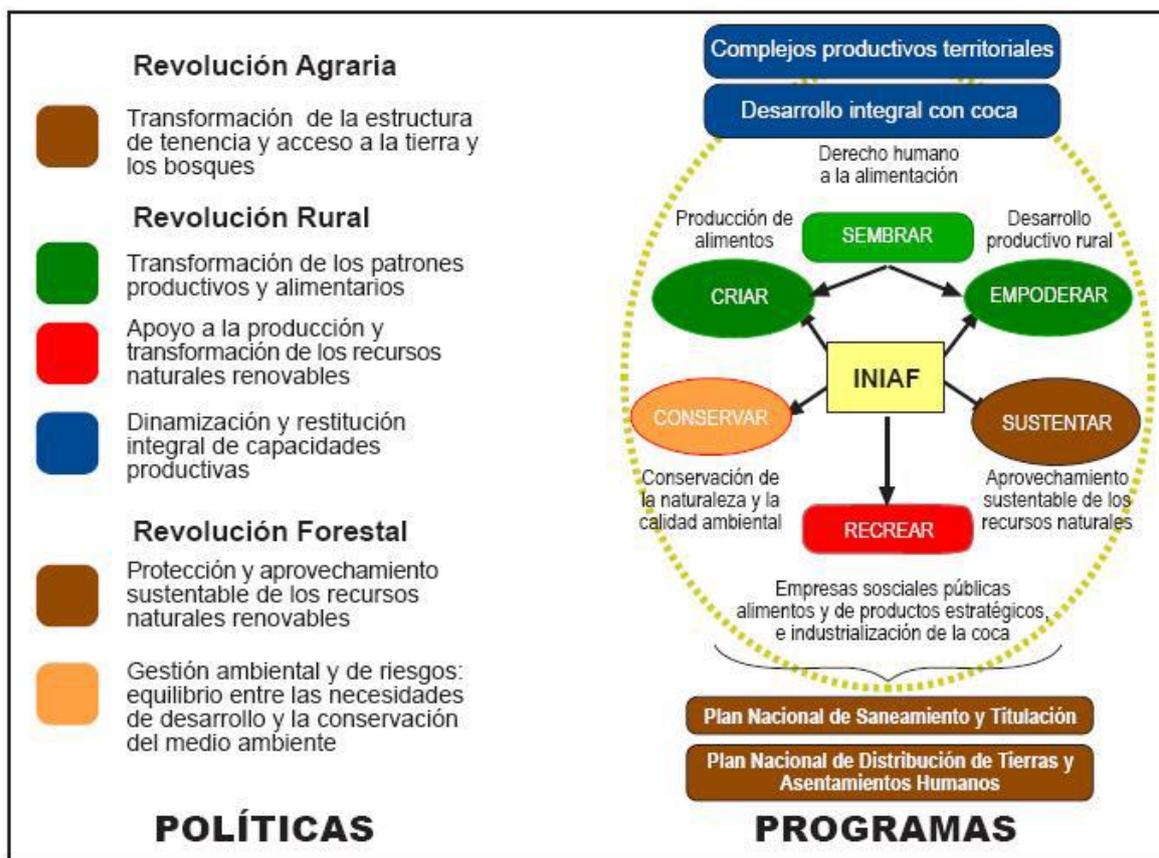
3.1 INIAF vision and mission

The Supreme Decree No.29611 of June 2008 established the **National Institute for Innovation in Agriculture, Livestock and Forestry** (*Instituto Nacional de Innovación Agropecuaria y Forestal*, INIAF) as the medium for 'strengthening public strategic institutions' in order to increase and improve productivity in agriculture, livestock and forestry. Despite being a governmental institute, initially only a small amount of INIAF financial resources were public, the rest being primarily linked to international cooperation programmes and integrated by internal funds⁸. More recently the state has allocated greater resources to the new institution, with a financial support comparable to the budget of a ministry, so that the contribution from international cooperation has decreased from 73 percent in 2008 to only 23 percent in 2011 (Hameleers et al., 2011).

Based on the principles of participatory innovation – intercultural dialogue, knowledge exchange and synergy – INIAF vision is to create effective linkages and become the leading institution in the agricultural innovation system at national and local level. Hence, its mission is 'contributing to national food security and sovereignty as well as sustainable and integrated rural development, through research and innovation, rescuing traditional and indigenous knowledge and incorporating the animal and vegetable genetic resources to the state heritage' (INIAF, 2009a). Figure 3.1 below illustrates the crosscutting role assigned to INIAF in the framework of the MDRyT services, as a facilitation agent working to maximize synergies and complementation among the different programmes promoted to achieve the country's rural development.

⁸ These funds were mostly generated from seeds certification (R. Andrada – Director of INIAF headquarters Seeds Division - personal communication, June 16, 2009).

Figure 3.1 INIAF crosscutting role among the MDRyT services



Source: INIAF (2010:16)⁹

The Institute has the mandate to coordinate and negotiate actions among all the agents within the country's agricultural innovation system in order to provide fundamental and applied research, technology transfer and 'free and universal' technical advice, through the coordination of rural extension, information diffusion and communication for development mechanisms (MDRAyMA, 2007).

⁹ Text of Figure 3.1:

- POLICIES:

Agrarian revolution > Transformation of land tenure and access to land and woodland structures.

Rural revolution > Transformation of production and food patterns; Support to the production and transformation of renewable natural resources; Greater dynamism and full return of productive capacities.

Forestry revolution > Protection and sustainable use of renewable natural resources; Environmental and risk management: balance between development requirements and environmental conservation.

- PROGRAMMES:

Local production systems

Integrated development with coca: Sowing: human right to food; Growing: food production; Empowering: rural production development; **INIAF**; Conserving: environmental conservation; Sustaining: sustainable use of natural resources; Recreating: public social enterprises for the production of food and industrialization of coca

National Plan for (Land) Regularization and Titling

National Plan for Distribution of Land and Human Settlements

In contrast with previous experiences oriented to privatization and market liberalisation, and against the ‘commodification’ of rural knowledge, INIAF is an integral part of a social policy reaffirming the State's centrality. It reintroduces the idea of free, public extension and advisory services, implying that rural information is a public good that must be available and potentially beneficial for all farmers, especially subsistence farmers.

Table 3.1 Defining features of INIAF in relation with IBTA and SIBTA

Defining Features	IBTA (1975-97)		SIBTA (2000-07)		INIAF (2009)	
Mission	Promoting technology generation, adaptation and transfer, as well as technical assistance to increase productivity		Increasing competitiveness and incomes in rural innovation through the transfer of modern and efficient technology		Fostering and improving agricultural innovation in order to ensure national food security and sovereignty	
Institutional nature	Public, centralized institution, providing R&E services based on experimental centres and projects		Private, decentralized institution focusing on technology adaptation/transfer		Public, decentralized institution fostering research and innovation based on technology and knowledge sharing	
Methodology	Unidirectional top-down research and extension approach grounded on the Green Revolution		Local demand-led approach of technology transfer, based on Applied Technology Innovation Plans (PITAs)		Participatory approach to guarantee farmers' involvement in all R&E, seed production and NRM processes	
Primary clientele	Larger, commercial and mainly male farmers		Producers and actors involved in the value chains with more market potential		Medium/small scale producers, subsistence and marginalized farmers	
Area of intervention	National level activities, but focused on the Andean and Valleys regions		National coverage focused on 4 macro ecoregions: Valleys, Altiplano, Humid Tropics, Chaco		National coverage through 10 departmental and regional offices	

Source: Author.

At the same time however, in the light of the previous experience of IBTA, it is worth noting that the creation of a centralist and government-controlled institution can be a constraint to more appropriate synergic and multidisciplinary innovation processes (see Delgado & Escobar, 2009). The challenge is to ensure people participation and mobilize different agents of the rural sector, even with contrasting interests, around common goals and undertakings.

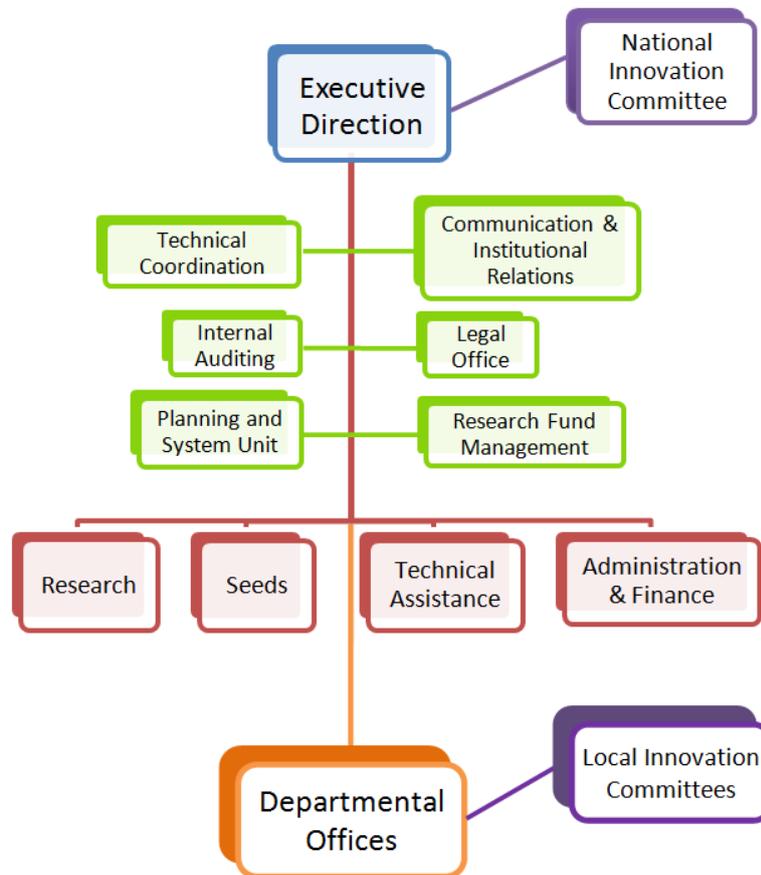
3.2 Institutional design

INIAF head office in La Paz is made up of three national divisions, respectively for Research, Technical Assistance and Seeds, supported by an Administration and Finance division. Each division is in turn sub-structured into units, managed by a technical director and supervised by the INIAF director general (see Figure 3.2 in the next page).

A set of independent units have been established under the executive direction, dealing with issues such as Technical Coordination, Legal Advice, Communication and Institutional Relations, among others. National coverage is ensured by decentralized offices in all nine departments of Bolivia (plus one regional office for the Chaco area), these replicating the central structure with a departmental director and three technical divisions plus administrative staff.

Because of its recent institutional arrangement, INIAF is still managing its organizational design. At the outset the institute was mainly relying on the former PNS¹⁰ (National Seed Programme) legacy of regional offices, resources and technical staff. Besides the PNS, also the former SIBTA Foundations have been incorporated causing some political issues at the local level.

¹⁰ The PNS (abbreviation of *Programa Nacional de Semillas*) was created in 1982 as a special programme of the Ministry for Agriculture, Livestock and Rural Development, in order to increase national crops productivity through the use of quality seeds. With its network of regional offices, the PNS worked successfully for 25 years, providing seed certification, fiscalization, extension and training services using a participatory approach. It has now officially been assimilated within INIAF Seeds division.

Figure 3.2 INIAF organigram

Source: Author.

Responsibility for programme planning is decentralized at the departmental level, but the approval of annual work plans, their evaluation and the management of funds are centralized. On the other side, the headquarters director has the primary authority for policy making. According to the former Director General¹¹, INIAF national objectives are defined on the basis of public policies (e.g. the eight staple crops identified and prioritized for food security in the National Development Plan) and negotiated with local priorities and specific needs.

Finally, each departmental office has an advisory body, put together during an introductory workshop where local producers, organizations and institutions set their priorities and elect their own representatives for each of the three INIAF activity areas.

¹¹ E. Terceros , personal communication, June 16, 2009

BOX 3.1 Notes from INIAF introductory workshop in Yacuiba

As directly observed by attending the *Taller de conformación del Consejo Técnico Consultivo Agropecuario y Forestal del INIAF Chaco* – held in Yacuiba on June 1, 2009 – local INIAF officers, assisted by headquarters staff, organize an introductory one-day event in all decentralized offices inviting a representation of local rural stakeholders. First of all, participants are briefed on INIAF mission, design, objectives, methodology and current challenges. Then members of producer associations, institutions or other relevant local bodies (included socio-political organizations) in turn present the local situation and express their concerns. Finally participants cluster into three groups – (1) Research; (2) Technical Assistance; and (3) Seeds – according to their main working area. Each of these groups defines a list of demands and indicates at least three group representatives to become members of the permanent local advisory committee.

Source: Author.

3.3 Position in the national AIS

An assessment of the opportunities to incorporate communication functions and services within INIAF must consider the complex landscape of the national agricultural innovation system. The Bolivian AIS today includes: on one side governmental institutions like INIAF or ministry-based agricultural and rural development programmes; and on the other a constellation of fairly independent initiatives among producers, civil society organizations, private associations, NGOs and international donors' programmes.

In 2004 the Inter-American Institute for Cooperation on Agriculture (IICA) undertook a study to map all active centres offering research capacities to generate agricultural knowledge, technology and innovation in Bolivia, classified according to experience, equipment, expertise and legal criteria. It emerged that only 12 percent of the country's research institutes present adequate capacities to carry out investigations, while the rest face modest (59 percent) and severe (29 percent) limitations (IICA, 2004).

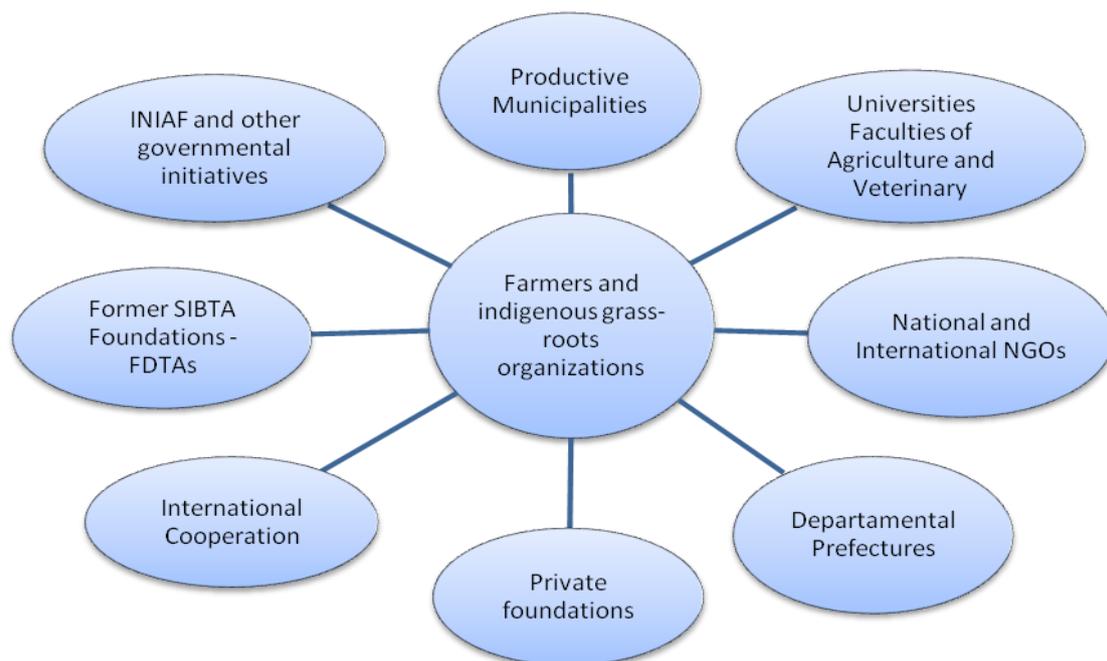
Table 3.2 Situation of research centres in Bolivia's macro eco-regions

Macro eco-regions	Research Centre Level			Total
	I	II	III	
VALLEYS	4	9	5	18
HUMID TROPIC	3	10	6	19
CHACO	0	8	-	8
HIGHLANDS	1	14	9	24
Total	8	41	20	69

Source: IICA (2004).

* Levels I, II and III mean respectively: adequate capacities, moderate limitations and severe limitations to carry out investigation.

A similar effort was made to map and assess the multiplicity of actors and institutional agents related to agricultural extension in Bolivian rural areas (see Rodriguez, 2009).

Figure 3.3 Extension stakeholders in the Bolivian AIS

Source: Author.

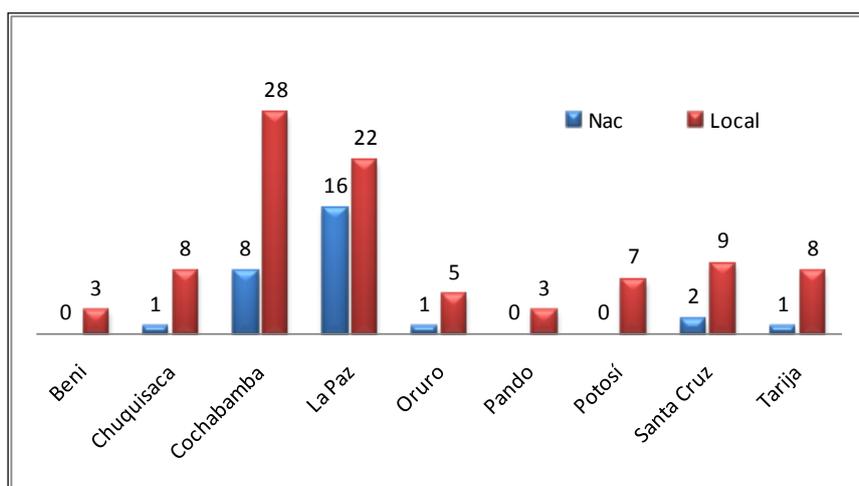
At the core of any extension or communication intervention are grassroots organizations of farmers and native indigenous communities. These are represented by a wide range of overlapping associations including grassroots territorial organizations

(OTBs), cooperatives, syndicates, agricultural central units, indigenous confederations, microenterprises, peasants economic organizations, *capitanías* and *ayllus*¹².

Local governments (prefectures, municipalities) have a big share in the funding and delivery of extension services and are now obliged by law to allocate at least 30 percent of their annual budget to productive activities in their territory. Furthermore, international donors fund private organizations while some of the former SIBTA Foundations are still operating independently. Finally, universities run field projects through their faculties of Agriculture and Veterinary Sciences, while NGOs, mainly organized in nationwide networks, tend to deliver extension executing public funds rather than generating their own proposals (Ranaboldo & Uribe, 2008:31).

When mapping advisory services in Bolivia, it is useful to distinguish between national and local coverage. The chart below shows that the territorial distribution of extension agents is generally very low, except for the departments of La Paz and Cochabamba.

Figure 3.4 Distribution of extension providers in Bolivia



Source: (Rodriguez, 2009).

According to Rodriguez, (2009: 56), the current trend in extension and advisory services supply is to promote participatory approaches, paying attention to the environment and strengthening local capacities. However, public and private service suppliers are not able to satisfy the range of diverse demands for technical advice.

¹² *Capitanías* and *Ayllus* are traditional communitarian forms of organization: *ayllu* refers to the extended family and local community structures rooted in the Andes, while *capitanias* are indigenous authorities typical of the lowlands.

These vary according to several factors, such as the nature, dimension and market orientation of the demanding organizations, the agro-ecological and farming context, or the characteristics of the local population, among others. This is particularly true in due to the fact that public extension services have actually been missing for considerable time in rural areas.

A perceived technical / political dichotomy

All in all, INIAF is a young institution just starting to consolidate its legitimacy as a key national actor, intended to generate and share strategic knowledge for agriculture and rural development. As it emerged from the field research carried out in preparation of this study, inter-institutional links are still relatively weak and feedback channels have been only recently established with other actors of the agricultural innovation system at the national level (universities, NGOs, private bodies, banks or credit institutes).

A further challenge is the perception, by other actors in the national agricultural innovation system, of INIAF as a political entity. The duality between the technical and political nature of the institution also reflects contrasting interpretations about what the public service *per se* is, and if and how it should integrate both technical and political aspects. It could be inferred that this is a legacy of past explicit connections between agricultural R&E institutions and development models grounded on political ideologies (see section 2.3).

Interviews with national and local stakeholders reveal that current political conflicts between national government and regional or departmental institutions struggling for local autonomy also have an impact on the implementation of a nation-wide agricultural policy. Political hostility can significantly limit the articulation of decentralized advisory services, which instead require a certain degree of mediation and improved coordination of national and local interests, investments and services. In addition, field observation provides evidence of what could be defined as a 'so close, so faraway' effect among rural institutional bodies, sometimes unable to coordinate efforts. This is what happens, for instance, in the relationship between INIAF and the Bolivian Innovation System (SBI) (Delgado & Escobar, 2009).

The SBI is promoted by the Vice-Ministry for Science and Technology as a liaison entity connecting public institutions, the productive system (small-scale farmers, small and medium enterprises, large commercial producers) and the knowledge generating

sector (universities and research centres), with a vision to organize and lead innovation processes in Bolivia (R. Carvajal¹³, seminar speech, June 9, 2009). Paradoxically, as confirmed by INIAF headquarters managers, there is a risk of non-interaction between the SBI, articulated in thematic 'Innovation Platforms', and INIAF; yet, the latter should be fully integrated as a governmental 'subsystem' specially responsible for innovation in agriculture, livestock and forestry. All this shows that even within the same governmental structure, policies coherently emanating from the same strategic plan can end up running parallel, without coordinating or complementing their efforts.

3.4 INIAF extension and communication services

INIAF originally builds upon the National Seed Programme structure (*Programa Nacional de Semillas*, PNS – see section 3.2). For this reason, it has inherited the methodology and personnel of the former PNS Technical Assistance (named *Asistencia Técnica Semillera*, hereafter referred to as ATS), which in the past years had developed successful extension and advisory experiences in the country. The vision is to expand the service supply, both in terms of human resources and thematically (from seeds to wider agricultural, livestock and forestry issues), in order to provide an integrated participatory rural extension service (INIAF, 2009a).

Within INIAF headquarters, the Technical Assistance Division is responsible for extension and advisory services. The institutional decentralized and site-specific scheme is maintained to ensure service effectiveness in Bolivia's extremely heterogeneous agro-ecological and socio-economic contexts: therefore Technical Assistance units are present in each departmental office, and local advisory committees have special representatives for extension issues.

Participatory extension methodology

The extension and technology transfer activities executed by former Regional Seed Offices¹⁴ were based on action research and participatory learning, creation of local networks among rural actors, demand appraisal and its articulation into strategic plans through inclusive decision-making processes.

¹³ Vice-Minister for Science and Technology, Ministry for Productive Development.

¹⁴ Now INIAF Departmental Offices.

The ATS methodological principles, as stated in PNS working documents (see Elias & Narvaez, n.d.), are as follows:

- 1) **Contextualization.** Attention to local situations and needs, facilitation and network-building for the creation of self-reliant knowledge and information systems.
- 2) **Constructivist participatory approach.** Emphasis on informal experimentation and mutual learning between scientific expertise and indigenous knowledge.
- 3) **Sharing of responsibilities.** Outcomes equally determined by farmers and extensionists, with facilitators' attitudes and abilities playing an important part.
- 4) **Participatory communication as a crosscutting element.** Communication as a tool to include farmers in investigation and decision-making about their livelihoods.
- 5) **Systems thinking.** Creation of virtual working units called SLAS (from Spanish *Sistemas Locales de Asistencia Semillera*, Local Systems of Seed Supply) involving rural agents, their activities and relationships, in order to achieve common goals in a given geographical area or farming/productive system.
- 6) **Affirmative assessment and planning.** '*Appreciative Inquiry*'¹⁵ to change mental patterns and build long-term vision in development interventions.
- 7) **Experimentation and knowledge networks.** Integration of research, observation and joint action to strengthen farmers' adaptive abilities and foster mutual learning.
- 8) **Capacity building.** Promotion of farmers' participation to create sound capacities, not only as a means for technology development.

A further principle introduced by INIAF is called 'converging demands', i.e. the negotiation between the demand of local producers or institutions, and the general priorities established by public national policies (INIAF, 2009a).

¹⁵ 'Appreciative Inquiry (AI) is about the coevolutionary search for the best in people, their organizations, and the relevant world around them. [...] AI involves the art and practice of asking questions that strengthen a system's capacity to apprehend, anticipate, and heighten positive potential. [...] In AI the arduous task of intervention gives way to the speed of imagination and innovation; instead of negation, criticism, and spiraling diagnosis, there is discovery, dream, and design.' (Cooperrider and Whitney, 1999)

Therefore, the ATS-inspired INIAF methodology of intervention goes by a sequence of interconnected steps, illustrated in Figure 3.5 and subsequently explained¹⁶:

Figure 3.5 INIAF Technical Assistance Methodology



Source: Author.

Induction. Once the intervention areas are selected, according to criteria such as priority crops or explicit demands of producers, extension workers organize a first meeting inviting local authorities, grass-roots organizations, NGOs, municipalities, farmers and women associations. This introductory workshop is intended to present INIAF and motivate future participants, with the final end of collecting a formal request of services through participatory methods (brainstorming, group dynamics).

Participatory Planning. First, a baseline survey is conducted covering: (a) aspects related to the territory (productive potential, actual use, socio-economic profile, access to market and basic services); (b) specific agricultural/livestock/forestry situation; (c) extension services supply in the area; (d) participants' characteristics, attitudes and expectations. Then a second workshop is organized: the baseline data and some preliminary guidelines prepared on its basis are discussed and validated by producers, who proceed in the identification and ranking of productive bottlenecks and possible solutions. The resulting strategic work plan includes goals to achieve and activities to implement within an established timetable.

¹⁶ Information accessed during an introductory INIAF workshop and elaborated through interviews with the headquarters Technical Assistance staff, June 2009.

Strategic Alliances and Training of Local Promoters. Key local actors are actively engaged throughout the process: establishing networks helps to negotiate changes, exchange know-how and to work in synergy with other institutions or service providers operating in the area. Furthermore, selected farmers are trained in practical and communication skills to act as facilitators themselves, in order to ensure ownership and sustainability.

Group Learning Activities. Participants are involved in a whole range of experiential, hands-on activities, aimed at improving learning and observation skills, thus providing farmers with a better basis for self-directed innovation. Through training and demonstration plots, exposure visits, field days, organization and participation in local rural fairs, this learning-by-doing approach sees farmers and facilitators interact on-site, to create a new and locally relevant body of knowledge.

Participatory Evaluation. The evaluation process includes structured interviews and questionnaires, visits to individual farmers to estimate the extent of content assimilation and technology adoption, as well as participatory dynamics to assess, ex-ante and ex-post, the achievement of training events. The feedback provided is a fundamental source to adjust the work plan in progress, according to the clients' perspective.

All in all, this methodology proposal reflects the principles of participatory extension and seems to be truly in line with the facilitatory communication for innovation approach (see section 1.4). For instance, the SLAS is a down-sized and site-specific application of the AIS thinking, with its stakeholders, interactions, rules, learning cycles, etc. The method also includes peer-to-peer communication through trained local promoters as a means for capacity building and mobilization among community members.

However, within the new institutional framework of INIAF, extension methodology is still in a design stage, and the adaptation from the previous PNS structure is not a straightforward process. As departmental INIAF staff reported during interviews, some of the main challenges arise, for instance, from the need to provide a broader thematic coverage:

- former PNS extension and advisory services, limited to seeds issues, now need to cover the whole area of agriculture, livestock and forestry;

- number and quality of human resources are inadequate in the face of differentiated demands (as observed in field visits, departmental offices have on average three extensionists for their whole geographical coverage);
- personnel, financial and infrastructural constraints increase the tendency to provide services just to the most accessible areas;
- staff require updating and follow-up training.

Interventions mainly focused on agricultural extension rather than livestock, forestry, climate adaptation and watershed management, as these, together with limited resources and local capacities, hinder the development of demonstration and experimentation centres: these have been recognized also in the framework of the INIAF *Institutional Strategic Plan* (abbreviated PEI in Spanish) among the major weaknesses affecting the supply of institutional extension services (INIAF 2010:26).

INIAF's understanding of communication

As mentioned earlier, the various functions of communication for rural development can be synthesised into: (a) informative, (b) didactic, and (c) facilitative. The latter function of facilitation implies raising awareness, exploring issues and different views, creating linkages, stimulating participation and knowledge exchanges; all these are central conditions for the functioning of multi-stakeholders agricultural innovation systems.

Although not fully implemented anymore, the original ATS from the 1990s¹⁷ put into action complementary communication activities to promote the use of quality seeds. The first step was a clear definition of the context (natural/social/economic phenomena that could make the topic seem irrelevant), the target groups (education, income, language, age, gender, previous knowledge) and their access to media (radio/TV/press coverage and use habits). On this basis a wide array of communication materials, with different communication objectives (motivation, education, post-training reference, information provision), were developed in a participatory way. Farmers were involved to different extents: in preliminary research to select the medium and elaborate the message, in pre-testing to discuss and modify it, or else fully participated in the design and production of communication materials (see Salinas, 1997). These were in turn

¹⁷ In 1990 was launched the first phase of a PNS project called 'Promotion and diffusion of the use of quality seed', rearticulated in 1992 to directly involve farmers in a participatory communication approach. The second phase was a pilot 'Participatory promotion of quality seed production' project, that expanded from the Santa Cruz area to the other departments until 1997, when it became a strategic component for the formulation of PNS national and regional work plans (Salinas, 1997).

videos, posters, leaflets, bulletins, farming calendars, stickers and also a soundtrack '*Cantata a la Semilla*' (*Singing to the Seed*) compiling ten popular songs, whose lyrics were composed and interpreted by producers themselves.

These experiences should be part of the background of many current INIAF technical assistants, however, it is interesting to analyse more in depth how the role of communication for rural development is perceived and understood within the institution.

Almost all interviewees belonging to INIAF national or departmental offices talked about communication as a 'strategic', 'crosscutting', 'absolutely fundamental' thing, but behind such enthusiastic definitions they revealed – sometimes explicitly expressed – a vague idea of what role communication could actually play in rural innovation, particularly when thinking about concrete services and policies that INIAF could deliver.

In addition, it could be said that departmental staff recognized the importance of communication for network building and even conflict management more than the executives. They have been facing more problems to legitimate INIAF's role in their local contexts, therefore are more in need of strategic alliances, especially where the enduring lack of public extension services brought some organizations to leading positions (e.g. PROINPA in the Cochabamba department). This emerged clearly from the interviews realized with field workers, when talking about their demands in relation to communication activities:

- difficulties in inter-institutional coordination in local rural contexts (e.g. with other extension providers) and need for stronger links with research institutes;
- request for knowledge/experiences exchange with technicians and field agents working in different INIAF thematic and/or geographic areas;
- poor and instrumental use of communication channels (by technicians urged by practical needs, but not trained in communication skills), often without previous needs assessment and not followed by impact evaluations;
- need for specialized human resources in departmental offices to provide technical expertise and work continuously with communication issues.

The lack of communication professionals is quite common, since human resources are often qualified and employed to concentrate on public relations, information diffusion or advertising of institutional activities.

In order to support INIAF in the organization and systematic provision of participatory communication services for rural development in Bolivia, the Ministry for Land and Rural Development (MDRyT) signed a project agreement with FAO to develop a National Communication Plan (FAO, 2009a). The agreement is part of the *Communication for Sustainable Development Initiative* (CSDI), a global programme currently implemented by FAO to promote innovative applications of communication to sustainable rural development, climate adaptation and food security¹⁸ (see section 4.5). As stated within INIAF *Institutional Strategic Plan* (PEI), the national ComDev plan incorporates communication tools and services at national and local level, to facilitate the involvement of rural communities in a process of co-creation of knowledge and strengthening of productive capacities (INIAF, 2010:50).

Remarkably, the organizational environment can be either a strong enabling or limiting factor for the development of planned communicative interventions, and this is particularly true in a bureaucratic public institution. When this research was carried out, the ComDev Unit featured into INIAF organogram as a sub-unit of the then *Information and Technical Assistance Division*. This position *per se* inhibited an effective crosscutting strategy, able to embrace and create linkages among different AIS actors and topics. Moreover, despite the presence of two distinct 'Institutional Communication' and 'ComDev' profiles under the Information and Communication label, the staff in charge of ComDev was actually busy with institutional and organizational tasks as well, such as organizing public events or designing leaflets and press kits¹⁹.

To overcome what was seen as a structural limitation, FAO CSDI proposed to establish a specific ComDev Unit with a broader operational and planning space within the institution, and to hire specialized staff able to design a long-term communication strategy. In 2010, the Institute underwent a partial restructuring, transforming the ComDev unit into an independent service programme directly supporting the executive direction. This is now in charge of harmonizing all activities into an integrated national system of communication services for agricultural innovation and rural development, based on action research, participatory mechanisms and constructive dialogue.

¹⁸ FAO Project GCP/INT/048/ITA.

¹⁹ Personal observation during field research, June 2009.

IV – Institutionalizing rural communication for development in Bolivia

Institutionalization is a multidimensional process, influenced by social interactions between different and contrasting agendas. Communication for Development (ComDev) methodologies facilitate power shifts among rural stakeholders and provide tools for participatory planning where all actors can reach a joint definition of their needs and goals, setting a common ground for concerted action.

4.1 Tracking best practices in rural ComDev

The Communication for Development discourse is not new in Bolivia, even if seldom applied in a participatory manner. Some significant exceptions can be found in ComDev applications focused on indigenous peoples' rights to information and communication²⁰, political leadership or gender issues.

From an assessment of current practice in the agricultural and rural sectors²¹, it could be inferred that, despite the presence of communication components and sometimes qualified ComDev practitioners in projects, decision-makers tend to encourage instrumental uses of communication, assuming that it is a peripheral activity in rural innovation rather than strategic for the achievement of wider participation and creative dialogue. This occurs despite the long-standing efforts conducted by numerous practitioners and organizations, FAO among others, to promote inclusive communication approaches in the country (Box 4.1 provides a good practice example of communication for agriculture and rural development in Bolivia).

²⁰ Extremely relevant is the experience of CIDOB (Confederation of Indigenous People of Eastern Bolivia), since 1994 defending the right of indigenous people to communication: training indigenous communicators specialized in filming, editing, radio and ICTs, managing telecentres and currently executing a ICTs project for political participation and leadership of indigenous women through blogs and networking. In the same line go the efforts of FORMASOL – a Santa Cruz based NGO providing technical assistance in communication with a special focus on radio, using media to promote the demands and claims of indigenous peoples – and of TEKO GUARANI, promoting education and communication programmes with an intercultural and bilingual approach in the Chaco region, just to name a few.

²¹ This conclusion is drawn from an overall analysis of ComDev experiences and significant initiatives identified based on key informants (Bolivian communication scholars and FAO officers) and selected for their thematic relevance (agriculture, forestry and rural development). The inputs considered are by no means supposed to give an exhaustive panorama of current ComDev practice in Bolivia.

Box 4.1 Boosting innovation through horizontal communication

The DFID-funded project '*Para ganar, hay que saber negociar*' was implemented by the International Centre for Tropical Agriculture (CIAT) in 2006/07.

Project objective. Strengthening capacities in communication to boost innovation processes, by articulating demand, generation and sharing of information, prioritizing knowledge and experience of local producers, improving access to information by marginalized groups.

Communication strategy. A participatory 'educational communication methodology' was developed to train extensionists (who in turn became facilitators and trained local community leaders, members of associations/cooperatives, rural teachers) to be 'Information and Communication Promoters' and reach the bulk of producers (Ramirez, 2006a). Promoters were trained to identify producers' information needs, recognize traditional knowledge and complement it with technical notions, decoded and conveyed in a simple and understandable language, through reasoned use of different media channels and formats. The method included social network analysis (SNA)²² to map information flows and the role that each actor plays in the process (provide/demand information, generate contents, promote new ideas, facilitate synergy and exchange between modern and indigenous knowledge). The mapping exercise helped identify critical points and better manage interactions and alliances among the system agents and institutions (Ramirez, 2006b).

Lessons learned. This project is a significant example of planned intervention that, although limited in time, focused on communication processes as a key element for rural development, using ICTs-enabled information and communication networks to boost production and marketing. Given their poor access to relevant information, rural communities often end up being isolated, unaware of market dynamics, barely competitive and highly dependant on external, sometimes inadequate, sources of information. Communication is thus useful not only to develop positive attitudes towards the adoption of innovations but also to enhance people's participation through horizontal learning.

Source: *Author.*

In general, however, agents of the Bolivian rural innovation system tend to give a secondary, at times even ornamental role to communication when applied to agricultural or rural development projects, and its use remains poorly participatory, if at all.

²² Social network analysis (SNA) is a key technique in modern sociology that views social relationships as a structure of nodes - the individuals or organizations within the networks - and ties - the relationships between the actors.

4.2 Overview of FAO ComDev experience in Bolivia

FAO has led the way in the application of participatory communication methods and tools in the field of agriculture and rural development. Its longstanding experience has made the organization a reference within the UN system and the international development community. In particular in Latin America, FAO developed the so-called 'Audiovisual Pedagogy', a video-based training methodology focused on listening to farmers, in order to document their knowledge and experiences, and to integrate these with modern scientific knowledge (Balit, 1998).

In Bolivia FAO has been pioneering and promoting an inclusive and participatory communication approach from the early 1990s. The first intervention focused on the Santa Cruz department and aimed at establishing an integrated communication system for the training, organization and participation of small-scale farmers. The project '*Comunicación para el Desarrollo en America Latina*' GCP/RLA/114/ITA was executed from 1993 to 1997 within the framework of an inter-institutional agreement for cooperation in Communication for Development. This involved FAO, the Prefecture of Santa Cruz, the Association of Municipalities (AMDECRUZ), the Autonomous University Gabriel Rene Moreno (UAGRM), research centres such as CIAT, peasants and indigenous associations (Paredes, 2003:22).

In 1995, the institutions involved in the project decided to perform communication activities in a systematic way (design, implementation and evaluation of communication plans, production of printed and audiovisual materials, etc.). Hence, a Centre for Communication and Rural Development (CECODER) was established in the Prefecture of Santa Cruz, representing all major departmental stakeholders. The system also included two decentralized Communication Units, similarly prompting network-building and negotiation, but at the local level and managed by municipalities and grass-root organizations. For instance the *Unidad de Comunicación Guaraní* was based in Camiri and managed by the Assembly of the Guaraní Peoples to design and implement local communication strategies and plans including the production of audiovisual packages.

In parallel, communicators trained by the project set up a private Centre for Rural Communication (CECOR), a 'social enterprise' subcontracted to provide training and production services, as well as supervision to communication planning.

A second phase started concurrently with the introduction of new responsibilities for rural development planning at the municipal level, namely after the Popular Participation Law (PPL)²³ introduced bottom-up mechanisms for participatory planning coordinated among municipal institutions, grassroots organizations (OTBs) and other local stakeholders, for instance the municipal development plans (*Planes de Desarrollo Municipal*, PDMs). Therefore, local institutions required expertise in information and knowledge management to better meet the needs of local communities (Ramirez & Fernandez, 2007:63).

Although formally instituted by the PPL in 1994, participation in development planning had not been realized at the local government level; with the project 'Information, Communication and Training for the Management of Natural Resources and Sustainable Agriculture' GCP/BOL/034/ITA (abbreviated CARENAS from Spanish), in 2003 FAO introduced communication as a tool to channel local demands and facilitate the participation of rural communities, while improving linkages among stakeholders. The CARENAS project was executed by FAO from 2003 to 2005 and the local counterparts were the Prefecture of Santa Cruz through the watershed management authority, and the University Gabriel Rene Moreno (UAGRM) through its Faculties of Technology and Agricultural Science (Troilo, 2006:5). The overall objective was to enhance local capacities and create a common understanding of the role of communication for NRM and sustainable agriculture.

Over a two-year period the project trained key municipal personnel but also extensionists, local NGOs, field-based practitioners and rural radio workers, with the appropriate skills to assess needs and priorities of rural communities and embed communication in their service delivery. Each of the eleven municipalities designated one technical assistant to be trained in participatory planning, namely to become a facilitator for the formulation of PDMs. They also learned to manage municipal communication systems, a range of media services especially designed for rural people, including radio and audio-visual materials (Ramirez & Fernandez, 2007:62). Furthermore, a Rural Information and Communication System (SICOR) was set up to

²³ In 1994 the government introduced the PPL as part of a decentralization strategy. Funds and authority were devolved to local municipalities, now in charge of planning and administrating local development including agriculture and sustainable management of natural resources. The law recognized grass-roots organizations and traditional/indigenous authorities under the new label of OTBs (*Organizaciones Territoriales de Base*) and officially involved them in co-managing and monitoring the allocation of public resources through a formal system of citizen participation (see Section 2.2).

connect all the stakeholders and institutions, even the municipalities not having specific units dealing with communication issues.

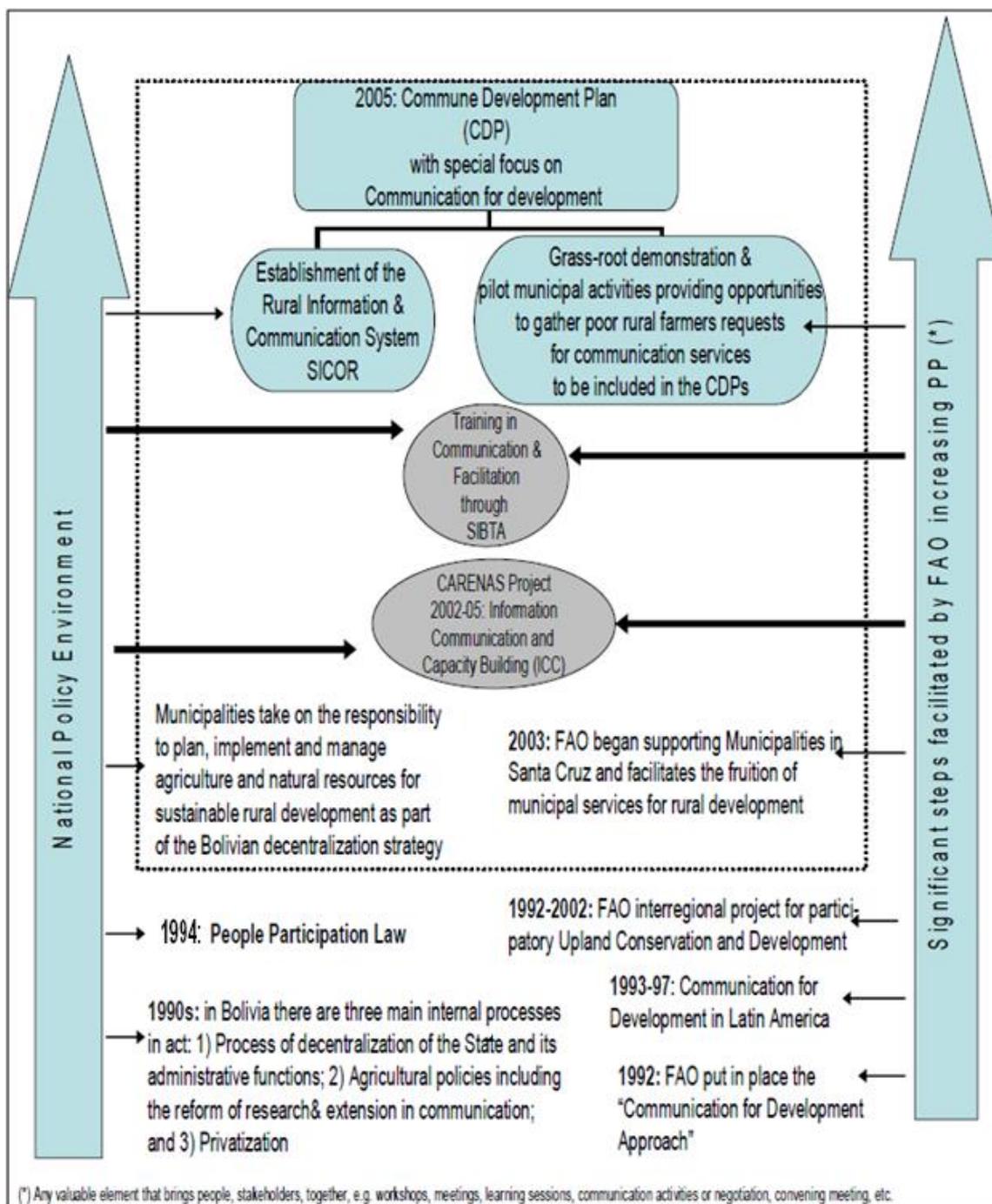
4.3 Institutionalizing rural communication at the local level

The capacity-building process initiated by FAO in the department of Santa Cruz, led in 2005 to the integration of CARENAS into the regional watershed management authority, the Piraí River Flood Channelling and Control Service (*Servicio de Encauzamiento de Aguas y Regularización del Río Piraí*, SEARPI), with the legal status of an independent foundation. Formally joined by six of the eleven municipalities initially involved in the project, it started working autonomously, facilitating participatory processes of rural information, communication and training. As explained later, an important dimension of this process was the establishment of an inter-institutional framework agreement involving key departmental actors including NGOs, civil society and producer organizations. Additionally, two municipalities created their own Communication Unit with full-time staff.

The introduction of participatory communication methods allowed technical staff of municipalities to improve the dialogue with rural families, listening to their needs, identifying local priorities and facilitating their participation in the formulation of more relevant and sustainable PDMs. Communication in itself became a public service, integrated as part of community-based planning and local governments' service delivery. Figure 4.1 in the next page summarizes FAO's long-term interaction with the Bolivian policy framework, and the efforts conducted to facilitate people's engagement in local planning through communication.

A specific adaptive attention was paid by FAO to the changing policy and institutional environment, in order to find from time to time suitable formulas for the delivery of communication services. The first step was to sign an inter-institutional agreement for cooperation in ComDev engaging key stakeholders at the departmental level. As a result, the CECODER was established as a not-for-profit central unit (later complemented by two decentralized units), whose steering committee was made up of local public/private institutions, plus producers and indigenous associations contributing to connect the service supply with the sector demands and, in turn, to the centre's financial autonomy (Paredes, 2003:27).

Figure 4.1 FAO's interaction with the policy environment



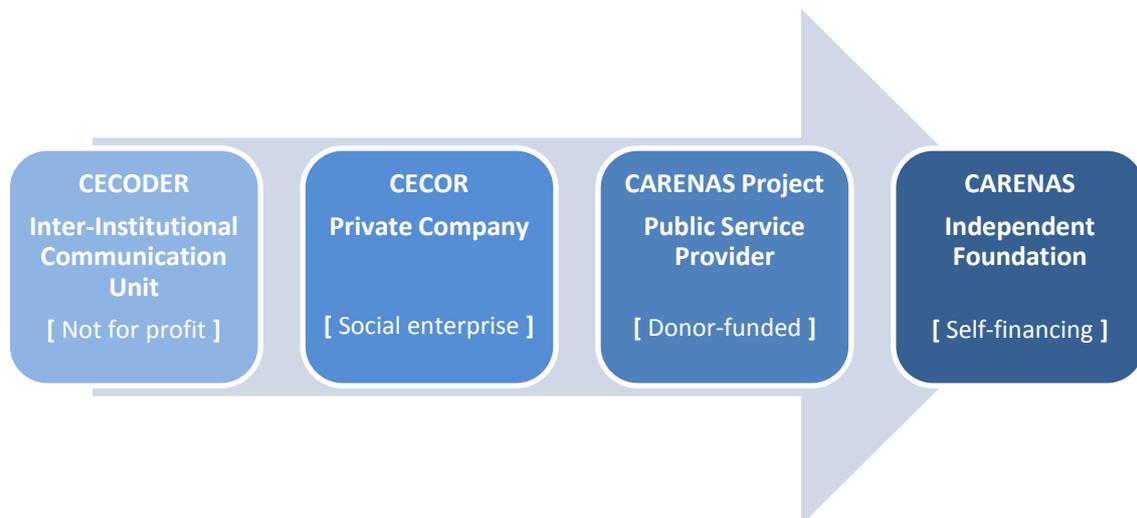
Source: (Ramirez & Fernandez, 2007:63)

FAO managed to activate a constructive dialogue with regional development policies so that, thanks to the inter-institutional agreement, the prefecture established a grant for those municipalities allocating at least 1 percent of PPL funds in communication activities within their PDMs. Such complementary municipal and departmental public investments created funding channels and a local market for communication services, stimulating the demand; therefore, to streamline and self-sustain the supply, the social

enterprise CECOR was designed and managed according to a private commercial model (ibid.). Some years later, the institutional shape of communication services was that of CARENAS project, a public body funded by international cooperation which ultimately evolved, in the context of decentralization policies, in an independent self-financing foundation, backed by member municipalities and affiliated local authorities of SEARPI. CARENAS Foundation is still operating at the departmental and municipal level as a supplier of communication and information services for rural development and NRM, including design of communication strategies and plans, production of multimedia materials, demand-led training in rural issues and ComDev. Among its clients are the rural population in the Santa Cruz Department but also municipalities, development agencies, NGOs, specialized R&E institutions, local media and farmers associations.

In sum, the capacity-building process supported by FAO started with the establishment of an inter-institutional not-for-profit central communication unit (CECODER), combined with a private commercial supplier of communication services (CECOR), later shifted to a public body funded by international cooperation (CARENAS project) and ultimately evolved in the independent, self-financing CARENAS Foundation, backed by member municipalities and affiliated local authorities.

Figure 4.2 Evolution of communication service provision in Santa Cruz



This evolution testifies to the need for long-lasting investments, as well as flexibility, in the design of institutional arrangements and service delivery formulas to achieve the institutionalization of communication services and their sustainability in the long run.

Local Information and Communication Plans

Another key aspect of the institutionalization of communication services is the active engagement of local actors in the planning process. While offering ComDev expertise, the CARENAS Foundation worked as a framework for negotiation and funding of services at the local level, promoting the implementation of Local Information and Communication Plans (*Planes Locales de Informacion y Comunicacion*, PLICs).

The PLICs are designed to engage rural communities, producer organizations, agricultural technicians, local institutions and development agencies, in order to identify rural information and communication needs, and collectively implement the appropriate responding actions. They have to be firmly based on agreements among local public/private development institutions, which designate personnel to be trained in ComDev and allocate financial resources to cover the expenses for workshops and field activities.

In Bolivia, the PLICs constituted a tool for participatory planning and implementation of communication services, with each actor responsible of executing the PLIC activities in its own area of influence. Specific problems were identified and tackled jointly, in a well-defined time and geographic area, with measurable outputs (Paredes, 2003:24). The resulting institutional platform established a market for communication services – to be contextualized in the absence of a national public extension system – fuelling the demand by local institutions, while strengthening and orienting the contributions of qualified suppliers. This allowed to bridge the gap between knowledge generators (universities and research centres, e.g. CIAT), intermediate users such as NGOs or farmers associations, and the final users in rural areas.

4.4 Local stakeholders and the institutionalization process

The present study included fieldwork in the department of Santa Cruz in June 2009, to get a good grasp of different stakeholders' perspectives in relation to ComDev services and their integration in local policies. People interviewed include CARENAS staff, technical staff of municipalities who had been trained as ComDev facilitators, a local decision-maker and a group of rural women as end users. Table 4.1 in the following pages summarizes key points to outline and compare each of these views, based on

primary data collected through interviews, personal communications and focus group discussions²⁴.

²⁴ Data drawn from personal communications and interviews carried out in the department of Santa Cruz on June 2 to 5, 2009, with: Pedro Gutierrez, director of CARENAS Foundation; Jorge Suarez, mayor of Saavedra Municipality; Luis Fernandez, livestock technical assistant of Santa Rosa Municipality; Franklin Banegas, technical assistant of Montero Municipality. A focus group was held on June 3, 2009 in the rural community of Terranova (Saavedra) with five women who had participated in a workshop run by CARENAS – Ana Flores, Mari Rodriguez, Pabla Flores, Berza Surubì, Cristina Flores – and Enrique Hubbaurs, agriculture and livestock technical assistant of Saavedra Municipality. In addition, specific questions were asked to Rolando Cuellar, director of Santa Cruz Departmental INIAF, representing a prospective communication service provider.

Table 4.1 Local stakeholders’ perspectives on rural communication services

Topic	Providers of communication services	Local decision maker	Municipal technical agents	Members of rural communities
Actual extension supply in rural areas	<p>Key local R&E agents (CIAT, CIPCA) deliver services mostly to those market-oriented producers who can contribute financially, while resource-poor farmers are excluded.</p> <p>Each municipality has a specific department with technical agents.</p>	<p>Research centres mainly reach medium and large-scale commercial farmers, while municipal technical agents are the only ones providing assistance to small subsistence farmers.</p>	<p>NGOs and development agencies leave as the project cycle is over.</p> <p>CIAT is not working in those municipalities that are politically aligned with the central government.</p> <p>Marginalized communities are only visited by municipal staff.</p>	<p>The municipal technician is the only person constantly supporting rural families. He knows their problems and facilitates external development projects willing to reach the communities.</p>
Problem solving	<p>Local technical capacities are often inadequate to foster innovation.</p> <p>Research centres are not really in touch with the field.</p> <p>A ComDev system is crucial for municipal staff to access scientific knowledge and share it with rural communities.</p>	<p>The needs of rural communities are easily monitored through grass-roots organizations (OTBs) or syndicates, which meet regularly, usually on a monthly base. They report to the municipality, as well as having their say in annual planning.</p>	<p>Sometimes the municipality turns to a research centre (CIAT) to get technical assistance.</p> <p>CARENAS was able to link several institutions and was effective in bringing researchers’ attention to local communities’ problems.</p>	<p>The first focal point for any problem that may occur in the community is the OTB president; then he/she reports to the municipal technical agents, who also regularly visit the community.</p>

Topic	Providers of communication services	Local decision maker	Municipal technical agents	Members of rural communities
Access to information and media	<p>Marginalized rural communities, with basic education, rarely access media other than radio but a considerable number of individuals own cell phones.</p> <p>Occasionally printed materials are delivered by extensionists.</p> <p>The digital divide is deeper in rural areas, telecentres are mostly located in urban settlements and agriculture-related content is not easily accessible.</p>	<p>Rural municipalities suffer a certain delay in adopting and applying new ICTs, basically due to poor infrastructures (communities often lack access to electricity) and high costs.</p>	<p>There is no access to TV because of the electricity shortage. People use radio as their external source of information, potentially during the whole day as farmers bring it to the field.</p> <p>The municipal webpage is used only to diffuse information, but rarely accessed by citizens.</p>	<p>It is impossible to visit other communities due to the lack of infrastructures.</p> <p>Beside municipal technicians, radio is the main external source of information (who owns one, listens to it daily).</p> <p>Where electricity is available very few have got TV.</p> <p>Most families own a mobile phone.</p>
Perceived value added of ComDev	<p>ComDev is a tool to build local capacities and promote dialogue on rural issues.</p> <p>Coordination of institutional actions helps concentrating development efforts and finding concrete answers to rural people's demands.</p>	<p>Communication is useful to raise awareness and consciousness about issues of public interest.</p> <p>ICTs are particularly important to interact with the external world and gain national and international visibility.</p>	<p>ComDev improves the impact of extension activities and helps covering dispersed rural areas.</p> <p>Interpersonal communication skills are fundamental.</p> <p>The mediating role of rural ComDev is pivotal in negotiating among institutions, without political biases.</p>	<p>[Not explicitly recorded during field research]</p>

Topic	Providers of communication services	Local decision maker	Municipal technical assistants	Members of rural communities
<p>Changes due to ComDev</p>	<p>Shift in power relations within the local AIS: agricultural technicians trained in ComDev become intermediaries with relevant institutions linked to rural development and acquire useful skills that empower them in decision-making processes, even within their community (some have become local leaders).</p>	<p>Capacity building: local people trained by CARENAS in ComDev are currently able to manage the municipal radio autonomously.</p>	<p>Methodology and personal attitudes: from a rigid and strictly technical extension to open dialogue and experience-based learning. Improved interaction with users/clients.</p> <p>Shift in power relations within the institution: communication impact useful to attract interest of decision-makers and higher budget.</p>	<p>Impact and comprehension: technical assistants use a simple language, together with audio/video supports that make it easier to understand.</p>
<p>Presence of a demand for ComDev services</p>	<p>Both rural families and municipal staff demand more ComDev training and services, since they appreciate and have assimilated its value.</p> <p>Decision makers 'intentionally mix up' ComDev with institutional/political communication.</p>	<p>Demand for communication mostly comes from members of rural communities, who have no resources to move around or go to the city.</p>	<p>People were very happy with the service provided and the whole community is upset since it stopped (S. Rosa).</p> <p>The demand for ComDev services depends on the value that the leaders of local administrations give to such tool.</p>	<p>Infrastructures and basic services such as water, electricity, or education are always given priority.</p> <p>Rural youths, who demand training in communication, then tend to use this opportunity to find a job and move to the city.</p>

Topic	Providers of communication services	Local decision maker	Municipal technical assistants	Members of rural communities
Constraints to institutionalization	<p>Political conflicts hinder interaction between governmental, departmental and municipal bodies (R&E centres included).</p> <p>Rural demands prioritize civil works so, unless the 'cement fever' runs out, it is hard to mainstream ComDev as a public service.</p>	<p>More training, follow-up and supervision is needed to build sound local communication capacities.</p> <p>There are difficulties in establishing enduring strategic alliances among institutions.</p>	<p>Discontinuity is created by political instability and turnover of municipal authorities and staff.</p> <p>A superficial approach to ComDev planning is linked to the lack of a rational consistent policy.</p> <p>Political or institutional communication is usually prioritised.</p>	<p>Lack of resources to be allocated to those services commonly considered secondary in municipal planning.</p>

Source: Author.

During the two-years of duration of the CARENAS project, frequent changes of authority involved either the Bolivian President, the Prefect of Santa Cruz (five times), members of the Council, the Principal of UAGRM and other counterparts. Despite such unstable environment, the sustainability of CARENAS and its successful evolution into an independent foundation, could be ascribed to the following elements (FAO, 2006):

- unique methodology oriented to smallholders and subsistence farmers' demands, who are generally unsatisfied due to the lack of a public extension system;
- negotiation and concerted action among local stakeholders (through PLICs) ensuring effectiveness and relevance of ComDev activities;
- formal/informal networks of qualified subjects formerly involved in FAO capacity development initiatives;
- increased space for popular participation and relative autonomy of municipalities in designing development policies and delivering public services.

However, against these enabling factors, several bottlenecks prevented in the long run a full integration of ComDev services into local policies, as emerged comparing the viewpoints of local actors.

Municipal technicians, the only ones delivering some extension service to smallholder farmers, do not hold sound capacities as to independently provide and manage rural communication services, nor is this supposed to be their primary role. At the same time, information flows with local research centres and, in general, synergies among local institutions remain quite weak.

On the other side, genuine ComDev services (not to be confused with public relations, unidirectional information or political campaigns) are commonly assumed as minor issues for local development by both decision makers and the farmers themselves. Thus, they are allocated little resources and space in policy planning compared with infrastructures and basic services.

Furthermore, the majority of interviewees agreed that a considerable limitation is represented by political instability and clashes, typical in Bolivia but particularly intense most recently, with clear-cut social and territorial divergences. In fact, in 2009, the CARENAS Foundation had to (even physically) move from the politically adverse

Prefecture of Santa Cruz to the Municipality of Montero²⁵. Finally, the lack of resources for consistent follow-up also stood in the way for the institutionalization of the ComDev approach promoted by CARENAS.

In conclusion, institutionalization is not a straightforward or one-way process (see section 1.6), but rather influenced by social interaction between different agendas, even opposite interests. Policies are only an enabling framework, which in turn needs to be adequately implemented at the organizational and individual level. CARENAS introduced the ComDev methodology and the PLICs in order to facilitate power shifts among rural development actors, fostering participatory planning and concerted action. But given that technical institutions are not politically neutral, it has been hard to establish long-lasting alliances and fruitful partnerships.

4.5 CSDI and the National Communication Plan

Nowadays, FAO is implementing a new initiative in communication for rural innovation in Bolivia, through a field component of its global programme named *Communication for Sustainable Development Initiative (CSDI)*²⁶.

The three-year project aims at developing and implementing Communication for Development plans, strategies and services in the country, with the overall purpose of improving national efforts in support of rural innovation and sustainable agricultural development. The project objective is to strengthen ComDev capacities within the Bolivian agricultural innovation system, among institutions, social actors and networks. In particular, it focuses on the prospective primary national provider and coordinator of extension and advisory services: INIAF.

To this end, the CSDI has supported the establishment of a Communication for Development Unit within INIAF, to harmonize all activities within an integrated National Communication Plan for rural development, based on action research, participatory mechanisms and constructive dialogue. Planned CSDI activities currently in their implementation stage include:

²⁵ According to the director of CARENAS, although officially responding to a stated rotating mechanism, this was the only way for the Foundation to continue its activity without restraint (P. Gutierrez, personal communication, June 3, 2009).

²⁶ The project GCP/INT048/ITA is implemented in Bolivia within the framework of a joint agreement between FAO, the Italian Ministry of Environment and Territory, and the Bolivian Ministry of Rural Development and Land. More information is available at <http://www.csdinitiative.org>.

- a. institutional ComDev strategy and work plan for both INIAF and the Ministry of Rural Development;
- b. participatory rural communication appraisals in five pilot areas, as basis for the design and implementation of local information and communication plans (PLICs) for agricultural innovation;
- c. training courses and workshops on ComDev methods and tools, to enhance local communication capacities;
- d. national information and communication services based on networks of rural radios, telecentres and an ICTs interactive platform for institutional coordination, information and knowledge sharing among researchers, extensionists and small-scale producers.

At its second year of implementation, the CSDI project in Bolivia has achieved initial results at the national level, with the positioning of ComDev into INIAF's strategic plan and programme of work, as well as at the field level with communication activities going on in three pilot areas (Yacuiba, Yapacaní and Chiquitanía).

The development *in loco* of a specific methodology for the design of local communication plans and programmes, based on participatory appraisals, implies a commitment to build upon and strengthen local capacities. This is meant to foster a process of local appropriation of ComDev tools and approaches, at the same time that the synergies among different innovation agents grow and the system coordination improves.

V – Mainstreaming rural communication services

The analysis conducted so far of rural development policies and institutions at the national level, compared with the perspective of facilitators, users and providers of communication services at the local level, settles the ground for further reflections on the potential mainstreaming of decentralized and participatory rural communication services in Bolivia.

5.1 Communication for rural innovation in Bolivia: key findings

A. Bolivian agricultural innovation system

The National Institute for Innovation in Agriculture, Livestock and Forestry (INIAF) is a strategic public institution established to coordinate actions among all the stakeholders within the country's agricultural innovation system (AIS). Its organizational scheme, built from the ashes of past national institutions for agricultural technology, adopts a public, decentralized model, and targets medium/small scale producers as its primary clientele, with a special attention to subsistence and resource-poor farmers. The institute aims at providing demand-led, integrated rural services covering research, seed production and technical assistance, where participatory information and communication methods should play a prominent role.

Indeed, when INIAF started its activity in January 2009, it had to face the consequences of a typical short-term vision, that characterized the previous systems and affects the AIS today:

- absence of an associative innovation culture: lack of multidisciplinary approaches, inter-institutional alliances or mechanisms to share knowledge and disseminate research findings;
- limited coordination and synergies among public, productive and knowledge generating sectors, particularly among extension providers in the same area who, on the contrary, compete for farmers' time and attention;
- high fragmentation of R&E initiatives, pluralism with a tendency to disperse and duplicate efforts, in the face of little resources available;

- skill shortage and, in general, poor technical capacities due to low investments in training human resources and an emphasis on process rather than product innovation (based exclusively on the adaptation of acquired technology);
- permanence of the conventional model of market-oriented innovation and top-down transfer of technology, despite a growing awareness of the need for more participatory and inclusive approaches.

Although INIAF is still quite young an institution, research revealed that it has been struggling to make its endeavours fully consistent with its vision and design. Being part of a broader state-led innovation process, the institution is somehow restrained in putting into practice its principles of negotiating 'converging demands' among local producers and national policies. The same applies for delegating the dialogue with local agents to INIAF departmental offices. Inter-institutional links are still relatively weak and feedback channels are being progressively established with other national actors such as universities, NGOs, farmers associations, private sector.

Furthermore, INIAF is often perceived as a governmental agency carrying a political value, instead of performing primarily a technical function. Such political bias attempts to delegitimize INIAF role within the innovation system, influencing its interaction with other technical agents and especially limiting collaborations with those who are not in favour of the change process (*proceso de cambio*) promoted by the government. However, this is expected to be significantly reduced with a more close interaction with people and local institutions in the field.

B. Communication for rural development practice

From field research some general observations can be drawn on communication for rural development in Bolivia:

- ComDev is hardly found autonomous and strategically planned, but rather figures as an instrumental component, integrated in rural development projects to merely disseminate information.
- Rarely ComDev is truly participatory, involving the 'beneficiaries' at every stage of project implementation or service provision, even less in the decision-making

processes. Exceptions can be found focusing on topics other than agricultural innovation such as indigenous people rights to information and communication, political leadership or gender issues.

- Decision-makers are unaware of ComDev functions and usually misunderstand it with public relations, one-way institutional information provision and campaigning or even political communication.
- A phenomenon of 'administrative myopia' tends to occur when, looking for immediate results, rural organizations allocate (human and financial) resources only to communication activities aimed at promoting their institutional image. Focusing solely on visibility efforts reflects a misconception of the role that communication can play for rural development.
- There is a shortage of human resources fully trained and with concrete ComDev experience.
- In rural areas, where basic services are lacking, there is a lower demand for ComDev since its potential benefit is not prioritized and resources are mainly oriented to physical infrastructures²⁷.

In this framework, the potential of rural communication services within a national institution like INIAF is substantial. The extension methodology – based on experiential group learning, strategic alliances and training of local promoters – should include participatory communication as a crosscutting element to engage rural stakeholders in planning and evaluation: this would help make the demand side inform the service supply. Going beyond the mutual exchange between farmers and extensionists, communication is a key tool to facilitate creative dialogue and synergy among all the very diverse actors in a pluralistic innovation system, stimulating the co-creation of agricultural knowledge and practices.

These communication functions are central to promote INIAF as an institutional catalyst of innovation and to overcome major deficiencies of the system, such as:

²⁷ As exemplarily stated by a municipal worker trained in communication, asked about the demand for communication services in rural areas: 'todo es puro pavimento' (F. Banegas, personal communication, June 5, 2009), meaning that what people need and ask for in Montero, right now, is paved roads.

- conventional top-down and market-oriented approaches based on technology transfer;
- poorly integrated research and extension efforts;
- lack of knowledge sharing channels;
- little involvement of farmers and failed opportunities to leverage on their horizontal networks.

The current situation urges the national institute to embed communication as a strategic line of action – in the form of integrated and cross-cutting participatory rural communication services (RCS) – in order to position itself as the coordinating body for rural innovation and development in Bolivia.

C. Institutionalization processes

As pointed out earlier, institutionalization (see Figure 1.4) is a multidimensional process of change. Macro-level policies interact with practices not only at the organizational, but also at the individual level, influenced in turn by power relationships and patterns of interaction. From this it emerges that the institutionalization of communication services implies changes in policy frameworks and institutional arrangements, but also specific allocation of funds, effective methodologies and coordination mechanisms, development of professional capacities.

The process of institutionalization assessed in this paper took place within a local agricultural innovation system, in the Santa Cruz Department. The Popular Participation Law of 1994 (see section 2.2) had created a favourable policy environment in Bolivia for municipal-level consultations; however, specific inputs were needed by local institutions and extension providers in order to develop proper facilitation and communication skills. To this end, FAO launched the CARENAS project in 2003, coming in the wake of a series of ComDev initiatives consistently promoted in the area since the early 1990s. The project aimed at enhancing communication capacities among municipal staff and other local stakeholders, to assess rural communities' needs and priorities, channel local demands, and facilitate participatory planning processes. The project finally resulted in a self-financing foundation that currently operates at both the municipal and national level as provider of rural communication services.

In the case of CARENAS, the main enabling factors responsible for the project sustainability and its evolution into an independent foundation were as follows:

- implementation of bottom-up mechanisms for municipal development planning;
- introduction – through training – of the ComDev methodology with increased impact and relevance of communicative interventions in rural areas;
- thanks to improved communication capacities, empowerment of local people in decision-making processes and shifts in power relations, within and among local institutions;
- promotion of effective tools for negotiation and participatory planning of communication interventions (PLICs) so that the plurality of stakeholders could act as an integrated system.

Nonetheless, besides these strengths, the institutionalization process run into serious limitations, mainly due to:

- political instability and turnover of local authorities and institutional staff;
- weak information flows between extensionists and knowledge generators;
- political characterisation of rural development institutions, hindering effective and purely technical alliances;
- misinterpretation of ComDev role and planning by local decision-makers;
- low demand from the end users;
- lack of resources for sustained ComDev training and follow-up, fundamental to build sound local capacities.

The elements identified as particularly influential to the specific process of institutionalization presented here, do not necessarily apply to the whole country, but the lessons learnt can be taken into consideration for the integration of communication services into development planning at the national level.

5.2 Insights and recommendations

As institutionalization processes imply changes at the macro-, meso- and micro- level, a whole bunch of factors have to be considered within an innovation system framework: these elements range from national agricultural policies to rural institutions' structures, methodologies and patterns of interaction, including also personal attitudes

and power relationships among stakeholders. The analytical insights that follow are meant to highlight what are the enabling factors opposed to the potential challenges for the mainstreaming of rural communication services in Bolivia.

The analysis of the major issues presented in Table 5.1 lays the foundation for recommending future actions to overcome institutional and system shortcomings.

Table 5.1 Opportunities and constraints for institutionalizing ComDev

Institutionalization layers	Opportunities	Constraints
Macro level	<ul style="list-style-type: none"> • Enabling policy framework 	<ul style="list-style-type: none"> • Political issues
Organizational level	<ul style="list-style-type: none"> • Favourable institutional design • Participatory extension methodology 	<ul style="list-style-type: none"> • Centralistic institutional culture • Structural and budgetary deficiency
Individual level	<ul style="list-style-type: none"> • Field workers' participatory skills • Interest and commitment 	<ul style="list-style-type: none"> • Poor ComDev capacities and misunderstanding of its functions

Source: Author.

Macro level opportunities vs. constraints

Enabling policy framework. Governmental policies, supporting social inclusion and knowledge sharing, are informed by systems thinking with a focus on innovation rather than production. The mechanisms introduced by the PPL to foster people's participation in decision-making, ensure grass-root organizations have their say in development planning. The R&E system reform is based on the acknowledgment of rural information as a public good, and recognizes the plurality of non-governmental agents as part of the rural innovation networks.

vs.

Political issues. Political turnover and the scarce harmonization (when not inconsistency) of national and departmental agricultural policies, hinder the effectiveness and continuity of development interventions, while the political bias influences interactions among technical institutions at national and local level. The

political connotation of rural institutions therefore contributes to the fragmentation of R&E initiatives. To decision-makers, communication remains a one-way tool to promote the institutional image and increase consensus.

Organizational level opportunities vs. constraints

Favourable institutional design. The new decentralized national institute for rural innovation, articulated into departmental offices, may allow a diversification in service provision according to diverse farming/productive systems, thus guarantee the relevance of the interventions. The advisory committees give the opportunity to include stakeholders for a consultative management.

Participatory extension methodology. The methodology for extension and advisory services adopted by INIAF is based on participatory planning and collective learning, and applies innovation systems thinking (see SLAS, section 3.4). Communication is understood as a crosscutting tool to achieve stakeholders' engagement and ownership while building strategic local alliances.

vs.

Centralistic institutional culture. Decentralization does not necessarily mean a flat management structure, especially in hierarchical governmental bodies. INIAF, for instance, is still short of the necessary feedback coming from other AIS actors (universities, private/producer organizations, credit institutes) who in practice are not participating at the decision-making nor at the executive level. In fact, a national headquarters' advisory committee is at present only mentioned in INIAF organogram.

Structural and budgetary deficiencies. Despite its mandate as liaison institution, INIAF has few financial and human resources to allocate to communication, and its organizational design has in some cases prevented effective crosscutting strategies.

Individual level opportunities vs. constraints

Field workers' participatory skills. The national system extensionists have already developed facilitation skills and are familiar with participatory methods. This represents an advantage for the integration of communication in their service delivery.

Interest and commitment. Governmental and INIAF decision-makers are attentive to ComDev potential, and both national and departmental staffs show a positive attitude.

vs.

Poor ComDev capacities and understanding. A limited vision, focused on achieving immediate results, often confuses ComDev with public relations or political communication. Furthermore, there is a significant shortage of human resources with concrete ComDev abilities.

Steps towards sustainable rural communication services

Communication has a fundamental role to play in ensuring that multiple rural stakeholders creatively dialogue to exchange information and knowledge, negotiate priorities and coordinate efforts: these are the interactions that occur among members of a truly integrated innovation system. Therefore, communication certainly holds the potential to be institutionalized as part of rural service provision, both at national and local level, within the Bolivian agricultural system.

As already stated, this process requires a long-term vision and high commitment at the policy, organizational and individual level. In order to kick off this multidimensional process of change, building upon the lessons learned about influential factors and opportunities for institutionalizing ComDev services, a number of recommended actions have been identified:

a. Avoid political biases in public services for innovation

The public nature of national rural institutions and their services should not entail a political connotation, and this requires a radical change in the organizational culture. In this sense, parallel efforts of different institutional, public and private, bodies within the pluralist AIS should be constructively coordinated and complemented.

b. Improve rural information and communication practice

Decision-makers and communication providers should become aware of the specific functions and value-added of participatory communication, intended as a two-way flow of information allowing feed-back and formulation of service demands by their clients

c. Increase the accountability of rural service providers

Extension and rural communication providers should be primarily accountable for their services to the end users, rather than to market priorities or external donors only. The content (problems, solutions, technologies) should be identified together with farmers' organizations and rural communities, and feed-back shared with researchers. This cycle is fundamental to make local demands inform the service supply.

d. Develop capacities of communication service providers

Recognize and raise the quality standards of communication services, as well as the professional capacities of service providers in designing context-tailored and site-specific communication strategies, promoting peer-to-peer communication and favourable learning environments, strengthening horizontal networks and strategic local alliances.

Looking more specifically into the case of Bolivia and its national institute for agricultural and rural innovation, the general recommendations above can be translated into short-term, concrete communication entry points:

- ***Analysis of the system dynamics***

In the broader framework of the agricultural innovation system, map agents and their relationships both at national and local level and identify the role that each actor plays in the process (provide/demand information, generate contents, promote new ideas, facilitate synergy and exchange between modern and indigenous knowledge). Devices like, for instance, the Social Network Analysis (SNA)²⁸ are particularly useful to define and assess information and communication flows, knowledge networks, stakeholders' interactions. This also helps identify critical points to focus on, in order to better manage interactions and alliances among the system agents and institutions.

- ***Database of AIS stakeholders***

Create a national database of all relevant subjects directly or indirectly linked to rural development and technology innovation in Bolivia, incorporating and complementing

²⁸ Social network analysis (SNA) is a key technique in modern sociology that views social relationships as a structure of nodes - the individuals or organizations within the networks - and ties - the relationships between the actors.

departmental records. Carry out a systematic mapping exercise as a necessary precondition to start building proactive networks.

- ***Documentation of lessons learned***

Document and systematize recent and ongoing extension, information, communication and training experiences relevant to agricultural, livestock and forestry innovation, in order to classify and validate methods and tools.

- ***Mapping ComDev human resources***

Identify qualified and available practitioners and service providers specialized in ComDev. In Bolivia, a good starting point could be the network of communicators trained by FAO in the country during the last fifteen years.

- ***Definition of ComDev institutional role***

Give to communication an appropriate role and larger operational and planning spaces, especially through the ComDev Unit within INIAF headquarters. Hire specialized staff able to design a long-term strategy and to implement project activities consistently and efficiently at the field level.

- ***Development of ComDev capacities***

Provide INIAF staff with intensive training on ComDev approaches, particularly in departmental offices where there is a bigger skill shortage, facing a higher demand for managing communication materials and planning communication strategies. It should be an ongoing medium-term process, supported by follow-up activities, and involve also decision-makers to clarify ComDev functions and develop participatory attitudes at all organizational levels.

- ***Coordination of national efforts***

Initiate an inter-ministerial dialogue to reduce the 'so close, so faraway effect' with the Bolivian Innovation System, coordinating actions to fully integrate INIAF as a subsystem responsible for innovation in agriculture, livestock and forestry.

- ***Neutralization of the political bias***

Strengthen the image of INIAF as a purely technical agency, both outside and within the organization, as to improve inter-institutional relations, particularly in areas with stronger political divergences.

- ***Up-scaling of local successful experiences***

Evaluate the PLICs experience and their potential to be up-scaled as a tool for participatory planning at the national level. With all participants setting common goals and jointly mobilizing technical, financial and social resources, inter-institutional agreements could also help overcoming communication's budgetary constraints.

- ***Integration of ICT tools***

Develop an integrated communication platform for rural innovation to foster information diffusion, knowledge sharing and capacity building, while strengthening the relations between extension and research agencies. This implies designing a communication and information system, supported by a hub network service for data collection and management, integrating ICTs with complementary media such as, for instance, video and mobile phones.

- ***Internal knowledge sharing***

Create specific channels for internal communication in response to INIAF field agents' demand for knowledge exchange with other technicians operating in different thematic/geographic areas.

References

- Balderrama Mariscal, C., Tassi, N., Miranda Lopez A., Aramayo Canedo, L. and Cazorla, I. (2011). *Rural migration in Bolivia: the impact of climate change, economic crisis and state policy*. Rural-Urban Series Working Paper. London: IIED.
- Balit, S. (1998). *Listening to farmers: Communication for participation and change in Latin America*. Rome: Food and Agriculture Organization of United Nations [FAO].
- Bessette, G. (2004). *Involving the Community: A Guide to Participatory Development Communication*. Ottawa, Canada, and Penang, Malaysia: International Development Research Centre [IDRC] and Southbound.
- Birner, R., Davis, K., Pender, J., Nkonya, E., Anandajayasekeram, P., Ekboir, J., Mbabu, A., David J., Spielman, D.J., Horna, D. and Benin, S. (2006). *From "Best Practice" to "Best Fit": A Framework for Analyzing Pluralistic Agricultural Advisory Services Worldwide*. Washington: International Food Policy Research Institute [IFPRI]. Retrieved April 20, 2009, from: <http://www.ifpri.org/pubs/ib/rb04.asp>
- Blackburn, J. and Holland J. (Eds.) (1998). *Who Changes? Institutionalizing participation in development*. London: Intermediate Technology Publications.
- Bojanic, A. J. (2001) Extension, Poverty and Vulnerability in Bolivia. In: ODI, *Extension, Poverty and Vulnerability in Bolivia and Colombia. Country Studies for the Neuchatel Initiative*. London: Overseas Development Institute [ODI].
- Chambers, R. (1983). *Rural Development: Putting the Last First*. Harlow: Longmans.
- Chambers, R. (1997). *Whose Reality Counts? Putting the First Last*. London: Intermediate Technology Publications.
- Chambers, R. (1998). Foreword. In J. Blackburn and J. Holland (Eds.), *Who Changes? Institutionalizing participation in development*, (pp. i-xi). London: Intermediate Technology Publications.
- Chapman, R. and Tripp, R. (2003). *Changing incentives for agricultural extension. A review of privatised extension in practice*. ODI Working Paper, No. 132. London: Overseas Development Institute [ODI].
- Communication for Sustainable Development Initiative [CSDI] (2010). *Collaborative change. A communication framework for climate change adaptation and food security*. Rome: Food and Agriculture Organization [FAO].

Del Castello, R. and Braun, P. M. (Eds.) (2006). *Framework on Effective Rural Communication for Development*. Roma: Food and Agriculture Organization of United Nations [FAO] and Deutsche Gesellschaft für Technische Zusammenarbeit [GTZ].

Delgado, F. and Escobar, V. (2009). *Innovación tecnológica, soberanía y seguridad alimentaria*. La Paz: Plural Editores-AGRUCO.

Elias, J. and Narvaez, A. (n.d.). *Guía Metodológica. Asistencia Técnica Semillera*. Unpublished internal document, ATS/UC, Programa Nacional de Semillas [PNS].

Ellis, F. and Biggs, S. (2001). Evolving Themes in Rural Development. *Development Policy Review*, 19 (4), 437-448.

Poppe, K. (2011). *Agricultural knowledge and information systems in transition: findings from the EU-SCAR Collaborative Working Group on AKIS*. OECD Conference on Agricultural Knowledge Systems, Paris 15-17 June 2011. European Standing Committee on Agricultural Research [EU-SCAR].

Farrington, J. (1995). The changing public role in agricultural extension. *Food Policy*, 20 (6), 537-544.

Farrington, J., Christoplos, I. and Kidd, A., with M. Beckman (2002). *Can Extension Contribute To Rural Poverty Reduction? Synthesis Of A Six-Country Study*. ODI Working Paper, No. 123. London: Overseas Development Institute [ODI].

Food and Agriculture Organization of United Nations [FAO] (1989). *Guidelines on Communication for Rural Development: a brief for development planners and project formulators*. Rome: FAO.

Food and Agriculture Organization of United Nations [FAO] (2006). *Informe de la misión de apoyo al proyecto CARENAS (Capacitación en Recursos Naturales y Agricultura Sostenible)*. Unpublished internal document, FAO.

Food and Agriculture Organization of United Nations [FAO] (2009a). *GCP/INT/04/ITA. Iniciativa de Comunicación para el Desarrollo Sostenible (ICDS). Plan Nacional para Bolivia*. Unpublished internal document, FAO.

Food and Agriculture Organization of United Nations [FAO] (2009b) *Sharing Knowledge with Rural People. Supporting Innovation for Agriculture and Rural Development*. Rome: FAO.

Food and Agriculture Organization of United Nations [FAO] & Global Forum for Rural Advisory Services [GFRAS] (2010). *Mobilizing the potential of rural and agricultural extension*. Rome: FAO.

Food and Agriculture Organization of United Nations [FAO] & World Bank [WB] (2000). *Agricultural Knowledge and Information Systems for Rural Development (AKIS/RD). Strategic Vision and Guiding Principles*. Rome: FAO, and Washington: World Bank.

Garforth, C. (2001). *Agricultural Knowledge and Information Systems in Hagaz, Eritrea*. Rome: Food and Agriculture Organization [FAO].

Garforth, C. and Norrish, P. (2002). *Listening and sharing: making knowledge and information work for development*. Unpublished internal document, University of Reading.

Godoy, R., de Franco, M. and Echeverría, R.C. (1993). *A brief history of agricultural research in Bolivia: Potatoes, maize, soybeans, and wheat compared*. Development Discussion Paper 460. Cambridge, MA: Harvard Institute for Development.

Gündel, S., Hancock, J. and Anderson, S. (2001). *Scaling-up Strategies for Research in Natural Resources Management: A Comparative Review*. Chatham: Natural Resources Institute.

Hartwick, F., Alexaki, A. and Baptista, R. (2007). *Innovation Systems Governance in Bolivia. Lessons for Agricultural Innovation Policies*. IFPRI Discussion Paper 00732. Washington DC: International Food Policy Research Institute [IFPRI].

Hirvonen, M. (2008). *A Tourist Guide to Systems Studies of Rural Innovation*. LINK Policy Resources on Rural Innovation Series No. 1. Learning Innovation and Knowledge [LINK].

Instituto Nacional de Innovación Agropecuaria y Forestal [INIAF] (2009a). *INIAF. Por la seguridad y soberanía alimentaria de los pueblos*. La Paz: Ministerio de Desarrollo Rural y Tierra [MDRyT].

Instituto Nacional de Innovación Agropecuaria y Forestal [INIAF] (2010). *Plan Estratégico Institucional 2011-2015*. La Paz: Ministerio de Desarrollo Rural y Tierra [MDRyT].

International Fund for Agricultural Development [IFAD] (2010). *Rural Poverty Country Profile -Bolivia*. Retrieved October 15, 2010, from the Rural Poverty Portal website: <http://www.ruralpovertyportal.org/web/guest/country/statistics/tags/bolivia>

International Food Policy Research Institute [IFPRI] (2007). *The Role of Government in Agricultural Innovation. Lessons from Bolivia*. Research Brief No. 8. Washington DC: IFPRI.

International Institute of Rural Reconstruction [IIRR] (2000). *Going to Scale: Can we bring more benefits to more people more quickly?*. Cavite: IIRR.

Jansen, H.G. (2006) The Bolivian System for Agricultural Technology (SIBTA). *Rural Development News*, 1, 30-31.

Leeuwis, C. and Pyburn, R. (Eds.) (2002). *Wheelbarrows full of frogs. Social learning in rural resource management*. Assen: Koninklijke Van Gorcum.

Leeuwis, C. (2004a). Fields of conflict and castles in the air. Some thoughts and observations on the role of communication in public sphere innovation processes. *The Journal of Agricultural Education and Extension*, 10 (2), 63-76.

Leeuwis, C., with Van den Ban, A. (2004b). *Communication for rural innovation: rethinking agricultural extension*. Oxford: Blackwell Publishing.

Leeuwis, C. (2004c). Changing views of innovation and the role of science. The 'socio-technical root-system' as a tool for identifying relevant cross-disciplinary research questions. In: *Proceedings of the Sixth IFSA European Symposium* (pp. 773-782). Vila Real: UTAD.

Leeuwis, C. and Hall, A. (2010). *Facing the challenges of climate change and food security: the role of research, extension and communication institutions*. Assignment commissioned by the FAO Research and Extension Branch. Unpublished document.

Lema, R., Meneses, O., Crespo A. and Muñoz-Reyes R. (2006). *Evaluación de efectos e impactos del SIBTA: Informe Final*. La Paz: Ministerio de Desarrollo Rural, Agropecuario y Medio Ambiente [MDRAyMA].

Ministerio de Desarrollo Rural, Agrario y Medio Ambiente [MDRAyMA] (2007). *Revolucion Rural, Agraria y Forestal*. La Paz: Gobierno de la República de Bolivia. Retrieved December 20, 2008, from: <http://www.agrobolivia.gov.bo>

Ministerio de Planificacion del Desarrollo [MPD] (2006). *Plan Nacional de Desarrollo: Bolivia digna, soberana, productiva y democrática para Vivir Bien*. La Paz: Gobierno de la República de Bolivia. Retrieved March 2, 2009, from: <http://www.planificacion.gov.bo>

Mulhall, A. E. and Garforth, C. J. (Eds.) (2000). *Equity implications for reforms in the financing and delivery of agricultural extension services*. Final Technical Report on

research project R6470 to the Department for International Development. Reading: AERDD, University of Reading.

Norrish, P., Batchelor, S. and Garforth, C. J. (2007). *Agriculture, Natural Resources and Livelihoods Policy – the evidence based need for good communication*. Reading: Gamos Consortium.

Paredes, J. A. (2003). *Experiencias de comunicación para el desarrollo y capacitación campesina en Bolivia*. Unpublished internal document, Food and Agriculture Organization [FAO].

Peres Arenas, J. A. and Medeiros Urioste, G. I. (2011). *La inversión pública en la agricultura. El caso de Bolivia*. La Paz: Campaña Justicia Económica SAM Oxfam.

Pimbert, M. (2004). *Institutionalising participation and people-centred processes in natural resource management. Research and publications highlights*. London: International Institute for Environment and Development [IIED], and Brighton: Institute of Development Studies [IDS].

Ramirez, M. (2006a). *Manual de Capacitación para Facilitadores SIMA - Servicio Informativo de Mercados Agropecuarios*. Cali: Centro Internacional de Agricultura Tropical [CIAT].

Ramirez, M. (2006b). *Módulos de Capacitación para Promotores de Información y Comunicación*. Cali: Centro Internacional de Agricultura Tropical [CIAT].

Ramirez, R. (2005). Communication functions in an evolving context of rural development. In O. Hemer and T. Tufte (Eds.), *Media and Glocal Change: Rethinking Communication for Development* (pp. 417-125). Unpublished document, Consejo Latinoamericano de Ciencias Sociales [CLACSO].

Ramirez, R. and Quarry W. (2004). *Communication for Development: a Medium for Innovation in Natural Resource Management*. International Development Research Centre [IDRC] / Food and Agriculture Organization [FAO].

Ramirez, R. and Fernandez, M. (2007). *Local Participation in Policy: Perspectives from FAO Experience*. FAO Livelihood Support Programme [LSP], Working Paper no.42.

Ranaboldo, C. and Uribe, M. (2008). *Catastro de Políticas y Programas de Desarrollo Rural en Bolivia Basados en un Enfoque Territorial*. Documento de Trabajo No. 24. Programa Dinámicas Territoriales Rurales. Santiago de Chile: Rimisp, Centro Latinoamericano para el Desarrollo Rural.

- Rivera, W. (2001). *Agricultural and Rural Extension Worldwide: Options for Institutional Reform in the Developing Countries*. Rome: Food and Agriculture Organization [FAO].
- Rivera, W. (2005). Communication for rural development: challenge to diffuse development information on non-agricultural rural needs. *Journal of International Agricultural Extension and Education*. 12 (1), 77-84.
- Rivera, W. (2008). Pathways and Tensions in the Family of Reform. *The Journal of Agricultural Education and Extension*, 14 (2), 101-109.
- Rodriguez, F. (2009). *Diagnostico de los Servicios de Extensión Agrícola en Bolivia*. Unpublished document, Instituto Nacional de Innovacion Agropecuaria y Forestal [INIAF].
- Rogers, E. M. (1962). *Diffusion of innovations*, 1st edition. New York: Free Press.
- Röling, N. G. (1988). *Extension Science. Information Systems in Agricultural Development*. Cambridge: Cambridge University Press.
- Röling, N. G. (1989). *The agricultural research-technology transfer interface: a knowledge systems perspective*. The Hague: International Service for National Agricultural Research [ISNAR].
- Röling, N. G. (1995). *What to think of extension? A comparison of three models of extension practice*. Reading: AERDD, University of Reading.
- Röling, N. G. and Wagemakers M. A. E. (Eds.) (1998). *Facilitating sustainable agriculture. Participatory learning and adaptive management in times of environmental uncertainty*. Cambridge: Cambridge University Press.
- Salinas Aramburo, J. (1997). *Comunicación Participativa: la Semilla del Desarrollo*. La Paz: Programa Nacional de Semillas [PNS].
- Scarborough, V., Killough, S., Johnon, D.A. and Farrington, J. (Eds.) (1997). *Farmer-led extension: concepts and practices*. London: Intermediate Technology Publications.
- Shepherd, D. D. (2009). *ToT – T&V – Facilitation*. Unpublished class notes, GIIDAE, University of Reading.
- Swanson, B., Bentz, R. and Sofranko, A. (Eds.) (1997). *Improving agricultural extension: a reference manual*. Rome: Food and Agriculture Organization [FAO].
- The American Heritage Dictionary of the English Language* (2000). 4th Edition. Boston: Houghton Mifflin Company.

The Neuchâtel Group (1999). *Common framework on agricultural extension*. Retrieved April 14, 2009, from <http://www.neuchatelinitiative.net>

Thiele, G., Wadsworth, J. and Velez, R. (1998). Creating Linkages: Lessons from Agricultural Research and Extension Liaison in Lowland Bolivia. *European Journal of Agricultural Education and Extension*, 4 (4), 213-223.

Troilo, A. (2006). *Information, Communication and Training for the Management of Natural Resources and Sustainable Agriculture. Food and Agricultural Organization, Republic of Bolivia Case study*. Unpublished document, Food and Agriculture Organization [FAO].

Unidad de Análisis Político-Económica [UDAPE] (2006). *Dossier de Estadísticas 2006*. La Paz: Gobierno de la República de Bolivia. Retrieved March 24, 2009, from : <http://www.udape.gov.bo/dossierweb2006/htms/dossier16.htm>.

United Nations Development Programme [UNDP] (2007). *Country Factsheets: Bolivia*. Retrieved March 12, 2009, from the UNDP website: http://hdrstats.undp.org/countries/country_fact_sheets/cty_fs_BOL.html

Van den Ban, A. W. and Hawkins H. S. (1996). *Agricultural Extension*. 2nd Ed. Oxford: Blackwell Science.

van Veldhuizen, L., Waters-Bayer, A., Killough, S., Espineli, M. and Gonsalves, J. (2002). Institutionalising Farmer Participatory Research. In C. Leeuwis and R. Pyburn (Eds.), *Wheelbarrows full of frogs. Social learning in rural resource management*. Assen: Koninklijke Van Gorcum.

World Bank [WB] (2006). *Enhancing Agricultural Innovation: How to Go Beyond the Strengthening of Research Systems*. Washington DC: World Bank.

World Bank [WB] (2008). *Project Information Document. Report No.: AB4388*. Washington DC: World Bank. Retrieved April 4, 2009, from: www-wds.worldbank.org

.



“People live the impacts of climate change, hence, they need knowledge and communication to better cope with it”