Institutional Innovation for Sustainable Agriculture and Rural Resources Management: Changing the rules of the game

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Institutional Innovation for Sustainable Agriculture and Rural Resources Management: Changing the rules of the game

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Julio Santamaria Guerra
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Acronyms and abbreviations

The following acronyms and abbreviations are used more than once in the text:

ACCESO Acceso Foundation (Costa Rica)
ADATA Alliance for Environmental Sustainability of Highlands (Panama)
AECI Spanish International Co-operation Agency
AgGNP Agricultural Gross National Product
AgR&D Agricultural Research and Development
AKIS Agricultural Knowledge and Information Systems
AMISCONDE Friendship, Conservation and Development project
ANAM National Environmental Authority (Panama)
ANCON National association for Nature Conservation (Panama)
ANDIA National Association of Agricultural Inputs Suppliers
APASAN Panamanian Association for Sustainable Agriculture and Natural Resources
APEMEP Panamanian Association of Small- and Medium-sized Agrarian Producers
ASOCODE Central American Association of Small- and Medium-sized Agrarian Producers
BDA Bank of Agricultural Development (Panama)
CATIE Tropical Agronomic Research and Education Centre
CBMAP Atlantic Meso-American Biological Corridor (Panama)
CDS City of Knowledge (Panama)
CEDAF Centre for Agriculture and Forestry Development (Dominican Republic)
CGIAR Consultative Group for International Agricultural Research
CIARA Foundation for Training and Applied Research in Agrarian Reform (Venezuela)
CICH Panama Canal Inter-Institutional Commission
CI Conservancy International
CIAT International Centre for Tropical Agriculture
CICA International Centre for Environmental Training (Panama)
CIMMYT International Centre for Maize and Wheat Improvement
CIP International Potato Centre
CIPP Context, Inputs, Process & Product
CIS Communication and Innovation Studies Chair Group
CORPOICA Agricultural Research Corporation (Colombia)
DANIDA Danish International Development Agency
DTT Directorate of Technology Transfer (IDIAP)
ECD Evaluating Capacity Development project (ISNAR)
ECLAC Economic Commission for Latin America and The Caribbean
EMBRAPA Brazilian Agricultural Research Corporation (Brazil)
ENGO Environmental Non Governmental Organisation
FAO Food and Agriculture Organisation of the United Nations
FCA Faculty of Agrarian Sciences (Panama)
FIAFOR Foundation for Agricultural and Forestry Research (Panama)
FONAIAP National Agricultural Research Institute (Venezuela)
FONTAGRO Regional Agricultural Technology Fund
FORAGRO Regional Research and Technological Development Forum
FTAA Free Trade Agreement of Americas
FUNDICCEP Foundation for Integral Development of Cerro Punta
GCPF Global Crop Protection Federation
GECI Strategic Group for Institutional Change
GGTCC Centre's Group for the Technical Management of Change
GGTCS Headquarter Group for the Technical Management of Change
GNP Gross National Product
GTCI Working Group for Institutional Change
GTZ German Technical Co-operation
IDB Inter-American Development Bank
IDIAP National Agricultural Research Institute of Panama
IDRC International Development Research Centre (Canada)
IFAD International Fund for Agricultural Development
IICA Inter-American Institute for Co-operation on Agriculture
IMA Institute for Agricultural Commercialisation (Panama)
IMF International Monetary Found

INIA National Agricultural Research Institute (Chile)
INIAP National Agricultural Research Institute (Ecuador)
INIFAP National Agricultural and Forestry Research Institute (Mexico)
INTA National Institute for Agrarian Technology (Argentina)
INTA National Institute for Agrarian Technology (Nicaragua)
INTEL National Institute of Tel-Communications (Panama)
IRHE Institute of Hydroelectric Resources (Panama)
ISA Institute of Agricultural Insurance (Panama)
ISNAR International Service for National Agricultural Research
ISP Institutional Strengthening Program
JICA Japanese International Co-operation Agency
LAC Latin America and The Caribbean
LACPA Latin American Crop Protection Association
LGC Land Grant College
MAG Ministry of Agriculture (Costa Rica)
MEF Ministry of Economy and Finances (Panama)
MIDA Ministry of Agricultural Development (Panama)
MINAG Ministry of Agriculture (Cuba)
MSI Management Systems International
NATURA Natura Foundation (Panama)
NARO National Agricultural Research Organisation
NGO Non Governmental Organisations
NP New Paradigm
NR Natural Resources
NRM Natural Resources Management
OECD Organisation for Economic Co-operation and Development
OXFAM Oxfam International
PCW Panama Canal Watershed
PM&E Planning, Monitoring and Evaluation
PNUD United Nation Development Program
PROIMPA Foundation for Research and Promotion of Andean Crops (Bolivia)
REDCAHOR Central American Network for Improvement of Horticultural Products
R&D Research and Development
RR&D Rural Research and Development
RRM Rural Resources Management
SDC Swiss Development Co-operation
SENACYT National Secretariat of Science Technology and Innovation
SIDHEA Hemispheric System for the Development of Higher Agricultural Education
SINCyTA National System of Agricultural Science and Technology (Cuba)
SONDEAR Panamanian Association for Development of Enterprises and Rural areas
SSM Soft Systems Methodology
S&T Science and Technology
STRI Smithsonian Tropical Research Institute
SWOT Strengths, Weaknesses, Opportunities and Threats
TNCs Trans-national Corporations
TOT Transfer of Technology
UCV Central University of Venezuela (Venezuela)
UNCTAD United Nations Conference on Trade and Development
UNPAP Union of Agrarian Producers of Panama
USAID United States Agency for International Development
WAU Wageningen Agricultural University
WB World Bank
WHO World-wide Health Organisation
WTO World-wide Trade Organisation.

Chapter 1. Introduction

1.1 Overview

This chapter aims to offer a background to the subject of institutional innovation in Rural Research & Development (RR&D) organisations, to present the societal and the research problem addressed and to explain why and how I became involved in this project.

First, I will present the societal problematic situation addressed in my research. Second my personal background and interest in this issue will be presented. My retrospective walk begins with my experiences in the decade of the 1980s as a technology transfer agent and rural economic researcher. Both roles were part of my work as a member of the technical staff of the National Agricultural Research Institute (IDIAP). My journey through time continues with the beginning of the1990s when I was a basic grain producer. Then, at the end of 1994, I returned to IDIAP to co-ordinate its process of institutional change. This third career phase corresponds to my experiences as facilitator of organisational and institutional change processes both at national and regional levels.

Finally, my fourth career phase is the subject of this book. My management, research, and capacity-building involvement in RR&D organisations in Latin America and The Caribbean during the last decade is strongly linked to the ISNAR New Paradigm Project. Together with a regional team of facilitators we have constructed a community of practice[1] on the topic of institutional innovation. In 1999, I decided to pursue my doctoral studies, for which this dissertation is one of the requirements. I will present at the end of this chapter the research problem addressed, the general research objective and purpose, as well as the outline of the book as a preamble to the next chapters.

1.2 Societal problem addressed

One of the main premises of this book is that we are living in a time of transition to a new epoch. The changes in the global context are the expression of deep simultaneous transformations in the economy, the relations of power, culture and human experience, in the direction of a new historical epoch (Castells, 1996; De Souza Silva *et al*., 2001). While the new epoch establishes itself, the current 'rules of development'[2] experience a crisis of legitimacy mainly because it is impossible to get out of complex problems under the same rules, social and cultural worldviews[3] and with the same paradigm that have created them.

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[1] Communities of practice are *"groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis"* (Wenger *et al.,* 2002:4)

[2] The words marked with single 'quotation marks' are mine, a habitual resource to denote that I am using a language that is not my own, to assign a determined sense to it, or to express doubt of the meaning that it usually receives. On the other hand, all phrases that appear between two quotation marks and in italics are quoted from the original text.

[3] Worldview represents "*a perspective or mental framework, (or Weltanschauung) at the interface between the observer and the observed. It is a perspective through which we frame what we 'see' in the world around us*" (Bawden, 2001:2). On more of this definition, see section 3.5.3

The crisis of legitimacy and pertinence of the 'rules of development' are reflected in their internal inconsistency. The internal consistency of set "rules of the game" (Young, 1994; North, 1990; De Souza Silva *et al*., 2001) is what I call *institutional coherence*.

I understand development to be the outcome of human interaction towards an *image of the future* that is culturally established and socially and contextually constructed. The current dominant 'rules of development' began to be established on 20 January, 1949, when H. S. Truman for the first time declared in his inauguration speech, the Southern hemisphere to be 'underdeveloped areas' and offered the *scientific advances* and *industrial progress* of the north as the future image for its development. In this dominant discourse, sustainable development means that developing countries should follow the track of western industrialised societies and economies. In practice, as is well noticed by other social scientists, the objective is more oriented 'to sustain' the 'development' of 'developed' countries (e.g., Esteva, 2001; Sachs, 2001). Therefore, supporting human efforts towards a conscious, responsible construction and the realisation of such *images of the future* in an enduring and nature-friendly way will be a more reliable strategy for promoting sustainable human development.

Currently, four alternative social worldviews (*mechanic*, *economic, evolutionary* and *holistic*) are in conflict, competing to prevail in a constantly changing context (De Souza Silva *et al.*, 2001). While certain historical periods may be characterised by the predominance of a particular worldview or the growing clash of opposing worldviews, others may manifest a "*kaleidoscope of possibilities and combinations"* (Long, 1992). Simultaneously, the loss of pertinence of the rules of development and the growing conflict among worldviews creates a crisis of perception among social, economic, political and institutional actors in development efforts. They are unable to understand what is going on, and consequently they are not capable of projecting the implications of ongoing changes onto their individual and organisational praxis.

For this reason, these actors have their capacity for interpretation drastically reduced, and their interventions have lost *correspondence* with the realities, necessities and aspirations of the context, and as a consequence, they lose *relevance* in the environment. In summary, the perception and legitimacy crises generate the vulnerability that today affects in different degrees the social, economic, political and organisational actors in development, mainly in the 'developing countries'.

Even the most appropriate policies, plans and projects toward sustainable development do not become implemented, they need to be carried out or supported by development organisations. Indeed, most development interventions are carried out or supported by public, private and/or non-governmental organisations (Rondinelli, 1990). If development organisations are not effective, if their performance is erratic over time, then it does not matter how appropriately sustainable development policies, plans, programs and projects are formulated. Thus, there will be no sustainable development without sustainable development organisations (Bonte-Friedheim & Sheridan 1997; De Souza Silva *et al*., 2001, Mato *et al*., 2001)

Organisations need institutional innovation to build the basis of their organisational sustainability. Sustainable organisations are those that are context-oriented and team-dependent, capable of acting flexibly and proactively. In short, sustainable organisations are changing organisations.

Thus, sustainable development is a multidimensional process that includes social, political, economic, and environmental as well as institutional dimensions. The importance of the

institutional dimension in the process of transformation to a more sustainable agriculture and rural resources management (RRM) has been highlighted by many authors in recent years (e.g., Lacki; 1996, Röling and Jiggins 1998; De Souza Silva *et al.,* 2001).

Development organisations do not exist in a social void, are not created to satisfy themselves, nor must they simply do what they wish. In order to contribute to the process of its own development, a society creates, finances, changes and possibly extinguishes organisations. If RR&D organisations are to start a journey from vulnerability to sustainability, they will have to go through a change process in which institutional innovation precedes technological innovation. This means that they need to change their frameworks for thinking, deciding, and acting first, before they start innovating their products and services.

In the search for existing sources of innovative solutions to these organisations emerging poorly understood challenges, what has prevailed are 'theories of action' for technological innovation and/or for its management. In fact, many RR&D organisations are undergoing change, but the changes generally are imposed from outside, and they focus mainly on changes in size, modification of the organisational chart and reduction in the number of employees (Busch & Bingen, 2000). However, there is no change in the ways the organisations interpret and intervene, because they rarely change their identity, vision, values, philosophy, principles, premises, approaches, etc. The change of form but not of content is handled mostly as an instrument to solve problems and to promote adjustments, and not as an interactive process of individual and collective learning to reconstruct a new institutional coherence for the organisation and to increase its degree of correspondence with the relevant context.

1.3 Learning through experience

It can be said that we learn through new experiences, both by changing ourselves and by using our new understanding to change the world we live in. This is learning through being or experiential learning. As Bawden puts it "e*xperiential learning is aprender siendo (learning through being) and it is the basis of any transformational change at any level - personal, communal, or societal. It is moreover, what those interested in systems principles and practices call emergent. Praxis emerges (and indeed continually emerges) as a function of interactions between theory, practice, and values, which it in turn influences in a dynamic dance of change* (Bawden, 2001:2). Consequently, learning is about changing our abilities and attitudes to inquiry, to attribute meaning, interpret, make decisions and act.

The following principles as described by Johnson and Johnson are based on the theory of experiential learning.

- *Effective experiential learning will affect the learner's cognitive structures (action theories), attitudes, values, perceptions, and behavioural patterns.*
- *People will believe more in knowledge they have discovered themselves than in knowledge presented by others.*
- *It takes more than information to change action theories, attitudes and behavioural patterns.*
- *For changes in behaviour patterns, attitudes and action theories to be permanent, both the person and the social environment have to change.*
- *It is easier to change a person's action theories, attitudes, and behavioural patterns in a group context than in an individual context* (Johnson & Johnson, 1987:19).

Learning is the process of adjusting and/or transforming our mental models to accommodate new experiences in a specific context.

Elaborating on Kolb's learning cycle - involving fourth dimension "*concrete experience (CE), abstract conceptualisation (AC), reflective observation (RO) and active experimentation*" (AE) (Kolb, 1984) -, Wilson and Morren pointed out that, "*experiences are grasped through a continuous cyclic process of perceiving meaning through direct experience and designing or modifying conceptual maps that we carry around internally*"(Wilson & Morren, 1990:31). According to Kolb's theory of experiential learning (see Figure 1.1), the way we perceive or grasp experience ranges from immersing ourselves in the experience using our senses and feelings in a 'concrete' way (CE), to thinking 'abstractly' through a logical analysis of ideas, systematic planning, and acting on the intellectual understanding of a situation (AC).

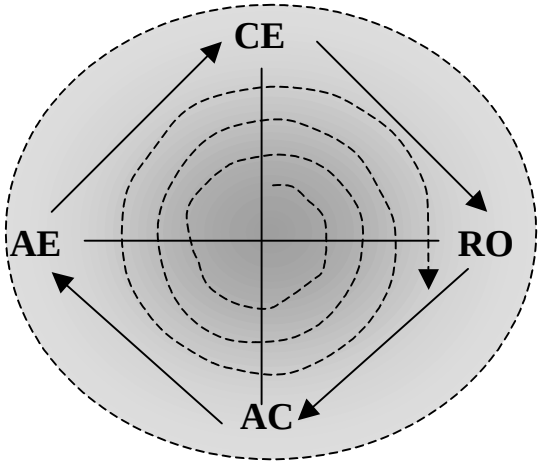

Figure 1.1 Preferred learning styles (adapted from Kolb, 1984 and Wilson & Morren, 1990)

Having perceived the experience, we need to understand it through transforming it. Here, individuals differ in their ability to get things done, in risk taking, influencing people and events through action (AE) and in careful observing before making a judgement, in viewing things from different perspectives, and looking for the meaning of things (RO). In being confronting with radically new situations that challenged my previous worldview, knowledge and abilities I have developed new ones that proved to be more adequate in the face of prevailing circumstances. This means that the learner does not need to continue or complete the entire Kolb's experiential cycle to come to a new understanding.

Indeed, the development of the learning spiral can be achieved by means of the shift from one helix to another. As Wilson & Morren stated "*we often resolve the tension associated with opposing ways of dealing with our world by allowing our preferred mode to dominate while suppressing or avoiding the others*" (*ibid.*:45).

In my opinion, personal experience alone does not generate knowledge and knowledge by itself does not bring about change. There are some qualitative changes in our circumstances that are able to radically transform our conceptual map or to produce an "*epistemological rupture*" or "*paradigm shift"*, therefore transforming our social praxis (Bachelard, 1988; Bawden, 1998, 2001 and Roling 2000, 2002).

In his studies, Allan Miller (1983 and 1985) suggested a graph, further developed by Bawden (1998), and adapted by Röling (2000) that shows the combination of two ontologies -

reductionism and holism -, and two epistemologies - positivism and constructivism -, which may help us to understand the *paradigm shift* (Figure 1.2).

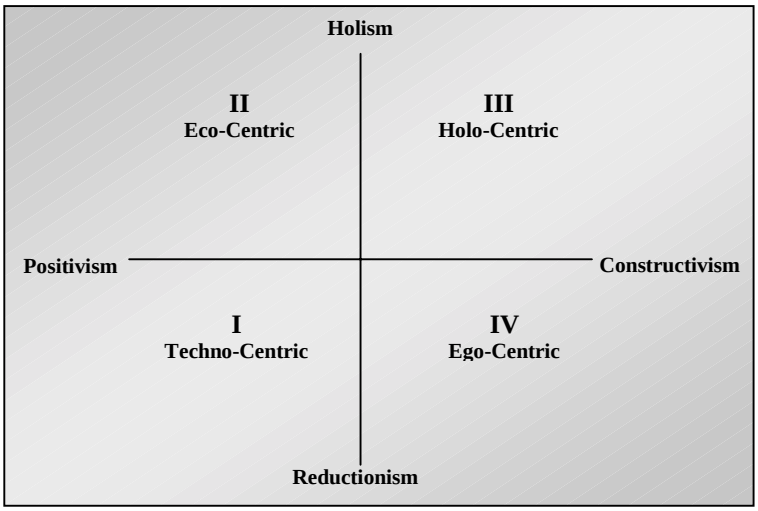

Figure 1.2 Paradigm shifts (based on Miller (1983 and 1985), Bawden (1998) and Röling (2000))

What are the form and nature of reality? This is the more relevant question, whose answer defines the ontological position. If it is assumed that a 'real' world exists independently of us, then only questions and answers associated to this independent reality will be considered as relevant. Other questions associated to aspects of moral and aesthetic meaning are ignored by not being of interest for science and, therefore, for research. On one side, objectivism assumes the existence of a 'natural' reality, independent of our perception and action; this reality, then can and must be apprehended in an objective form and without the interference of human interests. Indeed, reductionism tries to only explain a biological or social system from the operation of its smaller parts. Under this position, the study of reality requires its division into small parts, that must be divided into still smaller parts, until the units are found to be indivisible, which analysed separately of each other, finally reveal the essence of the whole. Wilson & Morren pointed out that "*the assumption that underlies the preference for reductionist ontology is that if each small issue can be explained, or each small component problem solved, then the original situation will be understandable in its complexity and will be susceptible to overall improvement*" (Wilson & Morren, 1990:45).

On the other hand, if the premise is that reality comprises what the subject's worldview allows him or her to perceive, and is therefore impregnated with the values, interest, commitments, intentions and contradictions of the subject, then the set of questions and answers will be very different from the previous one. With respect to reductionism, the holistic ontological position is the opposite, and considers that "*any complex situation has certain aspects or properties that are immediately lost when it is broken up into its component parts. The holistic stance assumes that no matter how much the individual parts are studied, the emergent properties possessed by the whole cannot be understood, nor can the original complex situation be improved, unless it is studied in its entirety*" (*ibid.*:45-46).

What is the nature of the relationship of the knower to the known and what can be known? The answer to this epistemological question is necessary and intimately connects to the answer to the previous ontological question. In scientific practice, for example, positivism considers the scientific method - the formal experimentation, empirical observation and statistical conventional analysis - as the only legitimate means to generate 'valid' or 'objective' knowledge. It accepts

the theoretical explanation of the mono-causal relations of the phenomena, the prediction of these phenomena in agreement with the 'natural' laws that govern them, and the discovery of 'the truth' as the only valid purposes for scientific practice. Today positivism is defied relentlesly by an increasing diversity of alternative forms of scientific practice, (Knorr-Cetina, 1981 and 1999; Latour, 1999; Bijker *et al*., 1989; Nonaka and Takeuchi, 1995).

In contrast, constructivism assumes that there are not one but multiple realities, apprehended in the form of multiple and intangible mental constructions, socially and experimentally constructed, and with meaning associated to the specific contexts that generate them. As a consequence of considering the existence of several socially constructed realities, an objective 'truth' cannot be postulated to generate an understanding of them. This understanding will necessarily be a product of negotiation that must happen in the interaction between the knower and the known.

Turning to the elements of Figure 1.2., the first quadrant (I) represents the combination based on reductionism and positivism. Miller called it the 'techno-centric' quadrant and Bawden called it the "*production techno-scientific*" paradigm. Central to this perspective is the belief about 'rightness' of technical intervention and instrumental manipulation of the world around us in the name of development and progress. Knowledge is seen to be able to be discovered, aggregated, stored, and disseminated through education and extension 'channels' which are notoriously linear (Bawden, 1998).

The second quadrant (II) is still based on positivism, but has moved on to a holistic perspective. Eco-system approaches fall into this quadrant. Bawden has called it the "*productivity eco-scientific*" paradigm. "*The whole entities to which they refer, are 'real', and their structures, organisation and performances can be described and computed in objectivist terms. Improvements in agricultural development are assessed according to measurable improvements in both the integrity of the system under study as well as the efficiencies by which inputs are transformed into outputs*" (*ibid*.:14).

Quadrant III represents a holistic approach linked to a constructivist epistemology. According to Röling, "*it gives space to soft system thinking and methodology …. to social learning in the sense of humans' collective learning to manage themselves, to futures that emerge from human interaction among multiple stakeholders, and to communicative rationality…*" (Röling, 2000:19). Bawden called this paradigm the "persistence paradigm" and has explained it as follows: it "*concerns itself with development through participation, where the central notion is that of co-evolution of collectives with their environment, and where a strong sense of the mutual inter-dependency of action and reaction, exist. Rather than seeing systems as if they were objects whose performances could be established and influenced 'out there in the real world', they are now reconceptualised as integrated ways of knowing which allow people to frame and share their conversations and passions about how they would like to relate to that world and to the others in it*" (Bawden, 1998:16).

Analysing Quadrant IV, Bawden has called it the "*pioneering*" paradigm. "*Animism and mysticism, legend and myth, were all important contexts within which generalisable principles were generated over the ages. Knowledge generated through 'the dreaming', for instance, and extended through the wisdom of the elders, is a very crucial aspect of life amongst many aboriginal peoples*" (*ibid.*:10). Röling has also argued that "*..this is also the quadrant which provides a home for those who consider spirituality as a key ingredient in ecological rationality and as the step beyond soft systems…*" (Röling, 2000:20).

In this section, I invite my readers to join me in a retrospective journey through my learning spiral. While there are many facets which could be stressed, I chose deliberately those that are related to my understanding of the role of science and technology in rural development efforts and about organisational and institutional change of RR&D organisations. Fortunately, I have written several articles and books at different points in time that allow me to look critically on related statements I have made in them and to assess my "*epistemic development"* (Bawden, 2000), through my learning process[4].

In the early 1980s, I was completing my undergraduate studies and was strongly convinced the role of science and technology in the development process. In 1980, I wrote: "*science is an active element of the modern material and spiritual culture of society. In addition to modifying the production processes, it exerts an increasing influence in the improvement of social relations among people*" (Santamaria, 1980:58). I thought the role of scientist was to "*contribute to national and social liberation, solidarity with people from other countries, scientific and technical rigor by means of multilateral education linked to his job and to the highest and progressive humanism*" (*ibid.*).

In 1981, I completed my studies at the Patrice Lumumba People's Friendship University in Moscow, and received the title of Agronomist Engineer and my first academic degree of Master of Science in Agriculture, with a major in Phytopathology. Just a short time later, back in my country, I participated in a competitive examination for hiring young agricultural researchers. The proposal, which I presented for this examination was a research project to identify races of the fungus *Piricularia orizae* as a way to improve the control of the most important rice crop disease in Panama. Despite my academic background and the institute's needs for specialists in plant protection, I was rejected as a researcher and finally contracted to work in the recently created Directorate of Technology Transfer (DTT) at the IDIAP. This was the end of my short career as a Phytopathologist and the starting point for a new challenging experience.

1.3.1 I am a transfer of technology agent

The task of a transfer agent was to 'help' researchers to better understand farmers' realities, so they could generate more appropriate technologies and to develop their skills to train extension agents, who were responsible for training producers. In practice, however, many of my activities were related to the promotion of IDIAP through expositions, workshops, field days and technical excursions to its research stations. In order to be able to do my job, I had to understand IDIAP's research work, and the character of its most important results. In others words, I had to be embedded in IDIAP culture, institutions and rationale. I would say that, for a long time, this embeddedness in 'scientific rationale' marked the way I thought about the role of science and technology in rural development efforts.

Working on transfer of technology, I realised (learned!) that we need more than science and technology to promote rural development. Particularly, while the research and technology transfer projects that work with producer organisations - mainly with *Asentamientos Campesinos*[5] - progressed almost without difficulties, research projects that worked with

[4] According to Bawden, "*our capacity to be methodologically systemic - to act in a manner in the present context that allows us to integrate moral dimension with techno-scientific reason in the exploration of 'better agriculture' - is a function of the state of development of our capacities for epistemic cognition*". (Bawden, 2000:10)

[5] *Asentamiento Campesino* is a producers' organisation in Panama, which was created at the end of the 1960s as a result of a land reform program. As an associative form of production, it is based on collective property of resources and the participation of members in the revenues according to their contribution to the production process.

individual producers were successful only with medium- and large-scale producers, but rarely with small producers who are, in fact, in the majority. The impact on the organised producers was really impressive. One of the reasons for the success of IDIAP's collaboration with *Asentamientos Campesinos* was the fact that the government also supported the *Asentamientos* with technical assistance, credit, and marketing of their products.

In 1982, at the beginning of the structural adjustment programs in Panama, the political and economic model was changed towards a more market-oriented agriculture and the *Asentamientos Campesinos* lost their priority on the government agenda. Consequently, extension programs were reoriented to work with individual agricultural producers. One of the main changes started in 1983 with the implementation of a program of Technology Transfer under the 'Training & Visit Methodology' financed and technically advised by USAID[6]. It is not surprising that my preoccupation with the necessity to take into account the producers' organisations that already existed and to promote other forms of organisation that could make the processes of technological change more viable, were not well accepted by the MIDA-USAID leadership. In addition, I suggested that the timeline of the program was unrealistic, and therefore the goals could not be achieved. As a result of my 'conflictual performance' regarding the MIDA-USAID program, I was transferred in 1983 to Santiago de Veraguas, where the DTT's headquarters was located at the time. Over the next three years, I worked at the national level as a head of IDIAP's training department, which allowed me to actively interact with colleagues of the public agrarian sector, both in field and management situations.

The national training department of IDIAP carried out an intensive training program oriented to train researchers and extension agents in methods and techniques of extension, and to improve their communication skills. The interaction with researchers, extension agents and producers allowed me to perceive the complexity of the relations among them and to think about other alternative approaches to promote technological change. In particular, the 'on - farm research' and 'production system research' approaches, among others, were useful to rethink the processes of technology transfer. In one of my first publications under the logo of IDIAP and the Directorate of Technology Transfer, I already expressed my concern for the need to consider economic, social and cultural variables when we tried to characterise farmers production systems. "*The technological change is not a single technical process*" (Sánchez & Santamaría, 1983:1).

At that time, my understanding of the process of research and technology transfer recognised: (i) the importance of enabling "*a mechanism of co-ordination among research and technology transfer organisations, based on an agricultural development plan, which articulated a set of coherent and multisectoral policies*"; and (ii) the necessity to consider "*the active participation of the researcher, the extension agent and the producer in all stages of the research and technology transfer process"* (*ibid.*:7).

While I was committed to the top-down linear approach - under which, research develops technologies, extension services transfer them, and farmers are expected to adopt them - I understood that this was not a single activity, but a complex process. In addition, I began to challenge the role of scientific knowledge as the only source of innovation, recognising that the extension agent and the producer could contribute to the process of research and technology transfer. This participation is well represented in Figure 1.3.

[6] The Technology Transfer program of MIDA-USAID was developed in the province of Chiriqui where I worked as a regional Transfer of Technology co-ordinator of IDIAP, which is why I had to participate in the meetings of the inter-institutional committee for implementing the program.

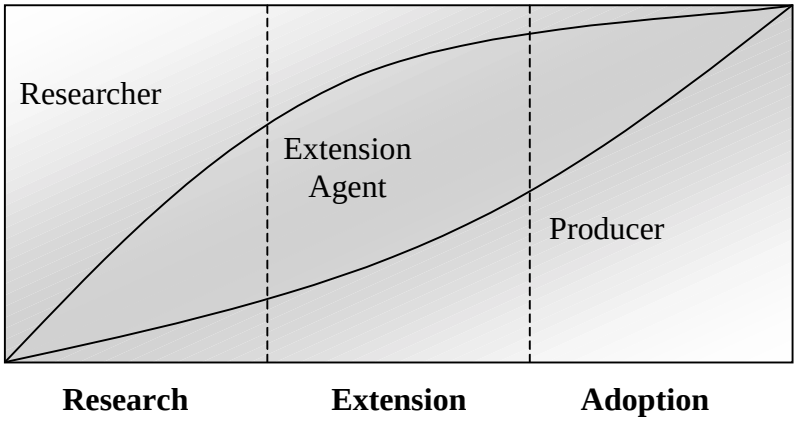

Figure 1.3 Research & technology transfer process (Sanchez & Santamaría, 1983).

Still, the intended "*participation of main actors*" had a merely instrumental character because it was a convenient way to deliver agricultural technologies. In addition, the dynamic of such a participatory process was dictated by IDIAP's goals: "*the participation of the producer must be permanent and active in each of the stages* (of the research and technology transfer process) *to guarantee a more effective and efficient adoption"* (ibid.:5).

This was also a mechanical view that saw the process as a continuum from science to farmers throughout different stages. According to my view at that time, interactions of the main actors in the research and technology transfer process have not only stages or moments at which they happen, but they also have space where they would be developed. This idea of validation and demonstration plots as 'space' for interaction is represented in Figure 1.4.

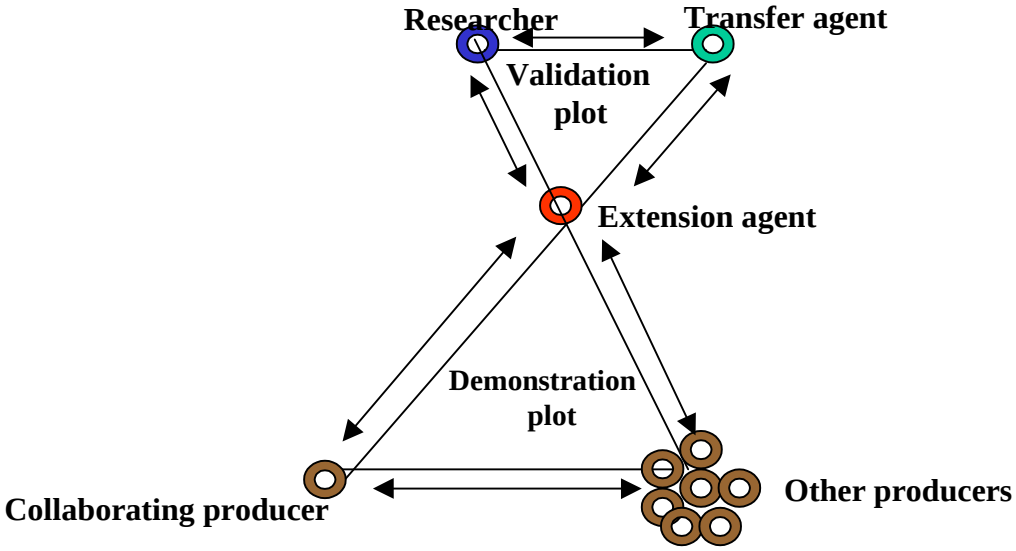

Figure 1.4 Interaction of main actors within validation and demonstration plots (based on Sanchez & Santamaria, 1983)

This was for me a time of 'technological change' as determined by rational instrumental techno-scientific logic and a focus on limiting or constraining factors, rather than on the whole.

1.3.2 I am a rural economic researcher

In 1985, the DTT was transformed into a Directorate of Information and Communication, and the national training department was eliminated. The new Directorate emphasised the provision of information to extension agents and students of agricultural schools and the improvement of the capabilities of researchers to write up their research results. IDIAP offered me a scholarship for graduate studies to obtain a new master's degree. I was accepted as a student in the MSc program at the Federal University of Paraiba in Brasil to study Rural Economics.

I spent 30 months between 1985 and 1987 doing a MSc in rural economics and focused my studies on understanding the dynamics of rural development under the capitalistic logic and hegemony. Through participating in the activities of two MSc programs (Rural Economics and Rural Sociology), I benefited from the lively and challenging debates about agrarian transformation in Latin American. I wrote a MSc thesis on the Panamanian experience of associative forms of agricultural production (Santamaria, 1987). The major contributions of this research to developing my understanding (learning!) were:

- The acknowledgement that development and agrarian transformation happen in historical situations and specific contexts, which we need to consider and to understand. Contrary to the linear determinism that I had previously adhered to, regarding the form of land property, I wrote in my thesis that: "*rural transformation does not constitute a linear process, it is a contradictory, dialectic process, where the 'general laws' affect only its tendency. Therefore, it is possible to find the co-existence of backward and modern forms of valorisation of land and the labour force"* (Santamaria, 1987:2); and

- The demystification of *Asentamientos Campesinos* as "*a window to socialism*" in Panama. In my thesis I pointed out that "*the associative forms of production are an effective and viable form to overcome the contradiction between the forms of valorisation of land and the capitalistic development of agriculture. In Panama the creation and development of Asentamientos Campesinos contributed to the acceleration of the establishment of capitalistic economic relations of production in agriculture*" (*ibid.*:65);

- The recognition of the large social and economic heterogeneity of 'production systems' in agriculture as one of the reasons why the process of research and technology transfer is oriented to a very limited number of producers. Therefore, these agricultural technologies became inappropriate for the great majority of agricultural producers. According to my previous experience as a transfer agent and the results of my research, I conclude that: "*the associative forms of production constitute schools of enterprise management and knowledge acquisition on the part of their membership. The co-operative force of the work, the optimisation of the use of the soil, the specialisation and the economic advantages of the economy of scale turn the associative forms of production into 'clients' or appropriate target groups for the technologies generated by the agricultural research organisations*" (*ibid.*: 47).

After I had completed my second MSc, I joined the newly created IDIAP department of economic studies as a researcher. This department belonged to the Directorate of Planning and was in charge of so-called 'socio-economic' research, which included among others, the study of factors that influence the technology adoption process. In addition we carried out the economic evaluation of research results, especially those that were in the stage of *validation* on farmers' plots. Every multidisciplinary team of researchers that worked in a specific crop or group of crops had to combine their scientific finding into a 'technological package' that has to include information about its economic feasibility and profitability.

During 1988 and 1989, I worked as part of the multidisciplinary teams of the Root and Tuber Research Program. The participation in this research program allowed me to interact with researchers from other Latin American Science and Technology (S&T) organisations and from International Agricultural Research Centres such as, the International Centre for Tropical Agriculture (CIAT), the Centre of Tropical Agricultural Research and Education (CATIE) and the International Centre for Maize and Wheat Improvement (CIMMYT).

While CIAT was a key promoter of the participatory research approach, in particular participatory diagnostic methods, CIMMYT and CATIE worked on production systems research. Working in multidisciplinary research teams on validation plots, I reinforced my conceptual framework on the particular rationality of different social actors in the research and technology transfer process. This idea was behind the proposal of considering the 'decision component', in addition to the technical, structural and supportive components of agricultural production systems (see Figure 1.5).

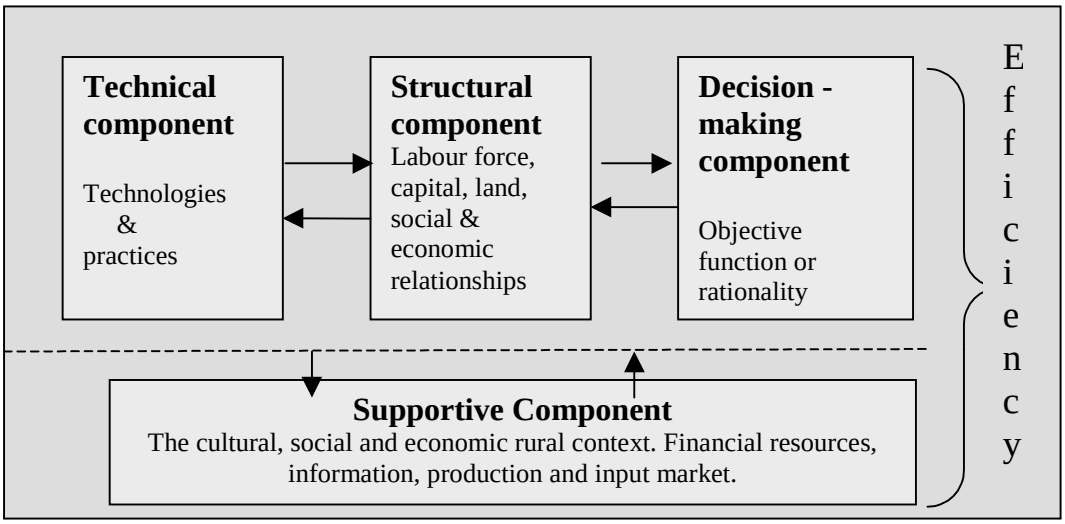

Figure 1.5 Agricultural production system - a theoretical model (Santamaría, 1989).

The decision-making component expresses *"the producers' rationality in terms of their goal functions, i.e., maximisation of profit, minimisation of risk, family self- sufficiency, etc.*" (Santamaría, 1989:4).

At that time, my fundamental preoccupation was the identification of the technological demand of production systems and to find ways to make it compatible with the supply of technology by agricultural research organisations. The different configuration of the production systems relating to the specificity of their components meant that there was a plurality of technological demands. In summary, though, "*the supply and the demand of technology are co-ordinated when the generation & transfer process responds to the technological demand of producers, satisfying the technological and supportive requirements of their production system*" (*ibid.*:5).

At this point, it is important to stress that until the end of the 1980s I was arguing from the technical perspective. From this perspective, I did not challenge the validity of the technology generated. Nevertheless, I concluded that there were only two ways of promoting technological change in agriculture: "*the generated technology may at the time be appropriate and profitable for certain types of systems, but not necessarily for others. This demonstrates the necessity of*

measures or policies that change the behaviour of some production systems towards the incorporation of the generated technology. Otherwise it would be necessary to introduce guidelines of technological policy that changes the research and technology process to generate technologies more compatible with the predominant production systems" (*ibid.*:8).

The most important lesson that I learned during the experiences described was that we have our own rationality or style to cope with our 'problems'. Recognising different rationales is important mainly when we try to promote technical and social change that has implications for the personal behaviour and the culture and values of the group to which we belong. For instance, my father is a *campesino* who never accepted any advice to adopt new technology and 'modern practices'. Hence, for the extension agents he was a 'traditionalist', resistant to change. Nevertheless, he carried out his own experiments and learned essentially by doing, from his practical successes and failures in the field. I remember he told me that once he sowed rice seeds in a plot, which had been a cattle corral, for a long time and that the rice plants grew very robust, but the yield was very low. Then he decided to use the manure as fertiliser for other crops instead of planting directly in it. Paradoxically, the agricultural extension service now is incorporating some organic practices, which were then traditional for *campesinos*.

1.3.3 I am an agricultural producer

At the beginning of the 1990s I was a basic grain producer (rice, beans, and corn) [7]. This changed the perspective on agricultural research & extension processes that I had had until then.

Confronted with practical challenges of operating an enterprise that I owned required decisions every day and the establishment of linkages with different people and organisations. As Long (1989) pointed out, "*the decisions the farmer makes are based upon value preferences and available stocks of knowledge, resources and relationships*" (Long, 1989:8). Commonly, the extension agent did not take into account these other dimensions of the farmer's situation, which affects his or her decisions.

Regarding values for example, I preferred to use fewer pesticides to produce agricultural products; i.e., I applied insecticides and other agrochemical only after having monitored the situation in the field. Indeed, I was using my own stock of knowledge and I did not follow all the recommendations contained in the "*technological package".* On the other hand, sometimes I knew that I needed to apply an agrochemical, but I did not have money to buy it, and therefore I just took the risk of not applying it. On the other hand, if the market accepts 4% weeds in paddy rice, why did I need to control weeds to 0% as the extension agent recommended? So my rice field did not look 100% "clean", as did some of neighbours' fields, but my financial costs were lower.

The relationships that I had established with *Asentamientos Campesinos* allowed me to develop some production projects with them on the basis of a mutually beneficial contract. They rented me their land and machinery at the regular market price, and I had to pay rent only when the products had been sold. In compensation, I gave preference to the members of *Asentamientos* as workers in my projects and acted as technical consultant in their agricultural projects, free of

[7] At midnight of December 20 1989, when the USA invaded Panama under the pretext of capturing General Noriega. In three days, the USA army occupied the territory of Panama and took over control of government activities. The first working day after the invasion, I was sacked by IDIAP, accused of being part of the armed resistance against the invasion. In 1990, I led the creation of CONSULTEC S.A., an enterprise that allowed me to start agricultural activities as a private consultant and grain producer.

charge. One friend of mine, who owned a petrol station, gave me credit on the same conditions. Another friend who worked for a company in Veraguas (a province 250 kilometres away) sold me fertilisers and agrochemical products more cheaply than the local representative of his company. In fact, I needed less operational capital and therefore I could cultivate more area than anticipated in the original project (based on the regular production cost).

From the point of view of a technician who works for a governmental organisation, I did not question the role of R&D organisations in rural development. Being a producer, I realised that these organisations have to change themselves before they can promote producer change and rural development.

At this time, I thought that organisational change of R&D organisations could be achieved by means of improving (or transforming) governmental policies and building the capacity of researchers and extension agents.

Consequently, the questions regarding institutional change were influenced by the image of organisation as a "*political system*" (Morgan, 1986) and by the vision of change as a political instrument (Mato *et al.*, 2001). Some questions were solved and new ones arose at that time: What could be done to ensure that researchers and extension agents are accountable to producers for the results they produce? What kind of personal abilities and organisational capabilities are required to promote technological and organisational change? What kind of changes should science and technology organisations undertake to better participate in rural development?

1.3.4 I am a facilitator and manager of institutional change

In 1995, a change process was initiated in IDIAP, which involved greater participation of producers and extension agents in strategic planning of research and the processes of technology generation. The main goal of this process was to fit the generation of agricultural technology with the demands and necessities of the context. I was the national co-ordinator and one of the intellectual leaders of this process of institutional change[8].

Regarding the change initiative of IDIAP, I pointed out that: "*the political boldness to create an institution of science and technology outside the capital, in a region where most small- and medium-sized producers of the country have settled and where poverty is concentrated, conditioned its organisational performance. From its inception IDIAP brought in itself the contradictions which are the source of its transformation: centralisation or decentralisation, colonial or liberating mentality, supply-driven or demand-oriented strategy, choice for food security or for market forces, dependency or conceptual and methodological autonomy. With this same boldness, we have initiated a process of institutional transformation that dares to defy the dominant elitism in the globalised science and technology context and to produce a proposal of change based on an endogenous exercise, wide participation and with the creative contribution of our human talents*" (Santamaria, 1997:1).

From its beginnings, the process of change within IDIAP was limited by two factors: institutional inertia and civil servant scepticism about their participation and the way the results of the process would be implemented.

The process of collective thinking about IDIAP's future constitutes the greatest and most participatory effort in its history. Some innovations were generated and implemented to affect

[8] The IDIAP institutional change process is analysed fully in chapter 5.

the political and technical management of the change process; i.e., the collective accomplishment of the situational and organisational analysis to identify strengths, weaknesses, opportunities, and threats (SWOT). The results of this analysis served as a basis for the generation of proposals of change of organisational identity and its entity.

The experience of three years' developing the change process of IDIAP was evaluated in a series of critical self-assessment workshops held in 1998, by a representative group of people from the various departments and representatives of other public R&D organisations.

The largest number of changes was reported in the dimension of organisational capacity. The organisation had enhanced its knowledge and skills in the areas of planning, monitoring and evaluation (PM&E) and the management of organisational change. It had developed strategic plans and proposals for integrated PM&E systems. Additional changes in capacity included improved teamwork and broadened and improved relations among national RR&D organisations, their stakeholders and clients (IDIAP, 1999a).

In the environmental dimension, according to the perception of participants, stakeholders and clients became more favourably disposed towards the organisation, largely as a result of their involvement in the change processes and in the R&D activities of the organisation.

In its effort towards institutional change, IDIAP managed to integrate itself into one of the Pilot Cases of the PM&E project of the International Service for National Agricultural Research (ISNAR) [9].

As co-ordinator of IDIAP's process of change, I became the "*local focal point"* with respect to collaboration between IDIAP and ISNAR. I was in charge of *systematisation*[10] of IDIAP experience on institutional change. Systematisation included accomplishing self-reflection workshops, participatory monitoring and evaluation of the process of change, writing of periodic reports and making presentations about these experiences in conferences and regional workshops. The results of the systematisation of IDIAP experiences on institutional change have been published by IDIAP and ISNAR (e.g., Santamaria & Sarmiento, 1997; Mato *et al*., 1997; Mato *et al*., 2000).

Additionally, since 1996, I have been one of the associated professionals of the ISNAR capacity-building projects in Latin America. My participation as part of the team of regional facilitators of this project has been focused on the dimension of management of institutional change, development of strategies for institutional change and strategic planning of RR&D organisations.

I have co-authored different ISNAR publications and training materials related to the management of institutional change. Working with ISNAR projects, I have contributed to the construction of a new approach to institutional change in Latin America. The project's *Strategic Approach* articulates five different but interdependent dimensions: future, context, participation, strategy and management.

The content of these five dimensions may be synthesised as follows:

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[9] More on the ISNAR "New Paradigm" project and its process of institutional innovation is presented in chapter 7.

[10] Systematisation is here and hereafter understood as: "*a process of social interaction for the participatory, negotiated and reflexive interpretation of processes. In order to understand the multiple, mutual, and complex influences of the critical factors shaping relevant experiences, from which lessons are derived to transform perceptions, decisions and actions"* (ISNAR, 2001a:3).

- ***Future:*** *starting from the premise that the future is not a given!, it has to be socially constructed, and the project develops the methodology for building alternative scenarios; as the future cannot be predicted, in order to influence it, we need to know the environmental, social, economic, political, technological, and institutional forces that are shaping major trends towards the future.*
- ***Context:*** *to develop an understanding of paradoxes and contradictions of the world in which the social actors operate and to project its implications on their practice; to support the creation of context-centric intervention models in correspondence with people's values and theories.*
- ***Participation****: to mobilise the imagination, capacity and commitment of the organisation's internal talents, and of its stakeholders, through the concepts of 'participation as power' and 'collective value-adding'.*
- ***Strategy:*** *sharing the praxeology of strategy development, to introduce the basic principles of strategic thinking and to develop a methodology for developing institutional strategies; to increase managers' capacity to successfully proceed in accordance with the organisation's emerging challenges.*
- ***Management:*** *to share reference elements for the social organisation of institutional innovation as well as for building an organisational management model; to act coherently, as a team, managers have to generate and share a framework for thinking, a framework for deciding and a framework for acting* (ISNAR, 2000).

This approach has been developed as an alternative to the prevailing *instrumental approach* to institutional change, which shapes change processes in most RR&D organisations in Latin America. These generally occur under the strong influence of external actors imposing economic structural adjustment and the guidance of re-engineering-related models.

Due to my participation in IDIAP's change process and in ISNAR's New Paradigm project, I became the national co-ordinator for formulating the Strategic Plan of Science, Technology and Innovation for the Agricultural Sector in Panama. This plan is now part of the National Strategic Plan of Science, Technology and Innovation that was approved by the National Parliament, and its implementation is co-ordinated by the National Secretariat of Science, Technology and Innovation (SENACYT).

In 1999, I was invited to share my experiences in institutional change at the 'Agricultural Forum' of the *XLIV Feria Internacional de San José de David*. I held the speech "*Generation of Knowledge for the Competitiveness and Sustainability of Agribusiness in the XXI Century*". Some of my beliefs, perceptions and perspectives on institutional change and the role of facilitators of change processes were presented then.

"Institutional change, from my analytical perspective, must make at least three macro steps:

a) to look outwards (to understand the changes in the context and to identify opportunities and challenges);
b) to look inwards (to project the implications of the external changes in the institutional mandate and to detect strengths and weaknesses); and
c) to formulate and implement a strategy for transformation (to change the thinking and acting of internal actors) and to institutionalise the new organisational culture.

Personal lessons learned from being associated professionally with the ISNAR New Paradigm Project and in the leadership of the national team on institutional change in IDIAP:

- *Institutional change is about collective learning, not about transfer of knowledge or technology.*
- *Facilitators of organisational change require political and interpersonal skills as well as managerial expertise.*
- *To be accepted as a facilitator, one must also have and show commitment to the kind of change, which one wants to promote.*
- *Development of "training materials" with the participation of the intended beneficiaries is essential to ensure their appropriateness and acceptability.*
- *Political and cultural aspects of institutional change should be considered explicitly*" (Santamaria, 1999:5).

During this period (1995-1999), I was also invited to support other initiatives in institutional change, both at the national and regional levels: e.g., by INTA (Nicaragua), REDCAHOR (Central American and Caribbean Network for Improvement Horticultural Products), NATURA Foundation (Panama), APEMEP (Panama), and by MIDA (Panama), among others.

As a matter of fact, since 1998, I have been one of the facilitators of the institutional strengthening program of environmental non-governmental organisations (ENGOs) and grassroots organisations in Panama carried out by the NATURA Foundation. From the external evaluation of this program in 2001, it is clear that 75% of beneficiaries recognised its positive impact on organisational performance, and 85% highlighted the commitment of, and the conceptual and methodological support given by, facilitators (NATURA, 2001).

This was a time of 'hard system thinking' for me, regarding technical and institutional innovation. Therefore, the organisation was seen as a 'system' that existed objectively and as such, it was possible to assess the situation of its components and interactions and to design strategies to improve it. To enhance the possibilities of successful organisational transformation, the whole process of change has to be participatory.

Personally, this was an exciting and challenging period, with full of new experiences. Not only were new answers required, but also the questions had changed: Why do development organisations have to be sustainable? Perhaps they do not have to be? What is the difference between organisation and institution? What really does institutional change mean? How is knowledge created and appropriated within an organisation? Where are the systems, and do they exist? Do we need to change the entire agricultural R&D system before changing a single organisation? How do asymmetric relations of power within organisations affect the change processes? What is organisational culture? What are the philosophical foundations for the resistance to change? How is organisational knowledge negotiated and how can we arrive at and maintain a consensus on meaning of concepts, principles and approaches? How can we integrate different rationales so that they work together in RR&D processes? What theories about institutional change do people hold?

In 1999, the Panamanian government decided to create a special scholarship program (Programa de Becas 2003[11]) aimed at training national professionals in strategic science and technology disciplines, at the doctoral and post-doctoral levels. The SENACYT held a competitive national examination to select the participants in this program. I was awarded a scholarship to do my

[11] In November 2003, the country will commemorate the centenary of the republic. The scholarship program-2003 was created to strengthen the national capacities according to the new global realities and emerging paradigms in science and technology.

doctoral studies in Management of Institutional Innovation at Wageningen Agricultural University, The Netherlands.

I started my doctoral studies in 1999 at the Department of Communication and Innovation Studies (CIS) of Wageningen University and Research Centre. As part of my study track, I completed my third MSc on Management of Agricultural Knowledge Systems and wrote a thesis titled "*Institutional Innovation in Agricultural Science and Technology Organisation in Panama*" (Santamaria, 2001). The accomplishment of the MSc program and my participation in the CIS's community of academics, researchers and students, has offered me the possibility to gain insights into new perspectives, methodologies and approaches related to rural transformation processes. This is the case of the "soft systems thinking", that forms the basis of the Agricultural Knowledge and Information System approach developed by the CIS learning community.

1.4 Research problem addressed

My management, research, and capacity-building involvement in RR&D organisations in Latin America and The Caribbean, and in the ISNAR New Paradigm Project, over the last decade, allowed me to closely observe the different dynamics of institutional change processes in those organisations. Despite the important role they play, they are facing serious problems of vulnerability, as well as an increasing challenge of transformation and consolidation in terms of being able to respond successfully to the opportunities and requirements that are being generated by the change of epoch affecting their institutional, social and economic contexts. In order for these organisations to play an active role in this changing environment, it is important to analyse the factors that are limiting their pertinence and relevance and to explore ways and means through which the RR&D organisations can be supported and strengthened.

Additionally, in the context of their organisational configurations, they need to promote synergies to tap the complementarities that exist among the public and private actors involved in generating and using knowledge and technology for agriculture and the rural milieu.

In their search for existing institutional sources of innovative solutions to these emerging poorly understood challenges, what has prevailed are theories of action[12] for technological innovation and/or for its management. In fact, many RR&D organisations are undergoing change, but the changes are generally imposed from outside, and they focus mainly on changes in size, modification of the organisational chart and reduction in the number of employees.

However, there is no change in the ways the organisations interpret and intervene, because they rarely change their identity, vision, values, philosophy, principles, premises, approaches, etc. The change of form but not of content is handled mostly as an instrument to solve problems and to promote adjustments, and not as an interactive process of individual and collective learning to reconstruct a new institutional coherence.

Very little is known about the processes of construction and reconstruction of theories of action for institutional innovation in RR&D organisations. Understanding these processes is crucial for

[12] As Argyris & Schön (1978) put it: *"Theories created to understand and predict may be quite different from theories created to help people make events come about. The latter, which we have called* ***theories of action****, must lead to understanding and prediction, but they must go beyond these two important functions"* (Argyris & Schön, 1978:5).

managing human talent and processes of institutional change. This critical gap stems *inter alia* from the lack of research in this area, especially with regard to public RR&D organisations, not-for-profit organisations, and capacity-building projects. On the basis of these considerations, I carried out qualitative research to critically examine state-of-the-art institutional innovation and to identify the theories of action informing it in RR&D organisations. **The general aim of this study is to better understand the processes, under which theories of action for management and facilitation of institutional innovation are generated, reconfigured and appropriated by participant actors. The purpose is to contribute to the construction of a new theory of action for the management and facilitation of institutional innovation in RR&D organisations.**

Framed in this way, this study is relevant for academics, for policy-makers and for development practitioners. While the empirical cases are primarily limited to Panama and Latin America, the findings of the study should be relevant to researchers and practitioners in any geographic region where these same issues about institutional innovation for rural development are raised. The expected audience comprises managers of RR&D, especially in 'developing countries', academics, donors interested in supporting institutional capacity-building projects, and facilitators of institutional change interested in information relevant to their social praxis.

1.5 Outline of the book

The introductory chapter offers a general background to the subject, the author's personal and professional experience and interest, the societal problematic situation and research problem addressed in this research as well as its objective and purpose.

The second chapter contains a characterisation of contexts - national, regional and global - of institutional innovation of RR&D organisations, including the importance of agriculture for economic development, the role of science and technology in rural development and the status of institutional support for rural research and development.

The third chapter provides a general theoretical background by means of a bibliographic review of the state-of-the-art of institutional innovation and its contribution towards organisational sustainability. General perspectives on organisational management and learning as well as specific perspectives on institutional innovation are reviewed.

The fourth chapter presents the main premises and general methodology of the research. The general research questions, methodological perspectives, analytical framework and methods for empirical study are presented.

The fifth, sixth and seventh chapters present the case studies. Each one of these chapters has an overview, a methodological explanation, empirical results and their analysis according to the analytical framework presented in chapter 4.

Keeping the lessons learned from the case studies and research findings in mind, chapter eight presents an alternative model of institutional innovation in RR&D organisations. Using the model as an organising framework, the results of the three studied cases are analysed and interpreted while answering the research questions of this dissertation. Finally, this conclusive chapter presents the implications of research findings for RR&D organisations' innovative *praxis* and for capacity-building interventions.

Chapter 2. The context of Institutional Innovation in RR&D Organisations

2.1 Overview

Agriculture and the rural sector, from a modern perspective, are considered to be strategic for the economic development of nations, due not only to their economic contribution, but also to their contribution to environmental development and in general to social well-being. In the context of agriculture, there are global, regional and national forces pressing for the transformation of the world's food regime towards the logic of capitalistic globalisation. In contrast, new forces are emerging which are interested in the development of a sustainable local agriculture able to respond to the long-term diverse needs of the societies practising it.

The aim of this chapter is to critically analyse the context of rural research and development and to project its implications for institutional innovation. This chapter analyses the most important processes affecting the context of RR&D with an emphasis on those processes that affect institutional change and innovation.

This chapter is presented in three sections. In the first of these, the national - Panamanian - context is described and analysed. In the next section, the major transformations in the region - Latin American and The Caribbean - are described and analysed. The focus of the third and final section will be on the global transformations and their influence on RR&D efforts.

2.2 The national context

Panama has not escaped from the transformation processes which are going on at both the global and regional levels. Capitalistic globalisation and the formation of regional and sub-regional economic blocks have forced Panamanian agriculture to survive in a context of unequal competition with subsidised foreign producers, and 'modernisation' policies implemented by the government.

The Panamanian economy is basically subordinated to the contribution of the service sector, which also includes the Panamanian International Financial Centre, the Colon's Free Trade Zone and the Panama Canal.

During the last decade, according to official statistics (Contraloria General, 2001), the annual rate of growth of the Gross National Product (GNP) has been decreasing. In 1991, it was 9.42% and in 2000, it was 2.5%. However, in nominal terms, it passed from 4,743.60 to B/ 7,345.70 million *balboas*[13] in 2000. The contribution of the agricultural sector to the GNP has varied from between 6.4 % and 7.2% in the last seven years, and passed from B/ 440.9 million in 1994 to B/ 475.0 million in 2000 (see Table 2.1).

[13] *Balboa* (B/.) is the Panamanian currency. 1 *Balboa* = 1 US Dollar.

Data from the agricultural census of 2001 indicate that the country has 236,613 farming units, which occupied 2,769,528.92 hectares. A study carried out by the IICA in 1998 showed that formally, primary agriculture contributes 8% on average to the GNP, but if its linkage to agro industry is added, this value adds up to 24% of the total economy (IICA, 1998). Additionally, the share of exports of primary products was 82% in 1997 (Contraloria General, 1999).

Table 2.1 Economic indicators of Panama (1990-2000)

Year	GNP (million B/)	Annual rate of growth	AgGNP (million B/)	AgGNP/GNP %
1994	6,091.30	2.9	440.9	7.2
1995	6,198.00	1.8	435.0	7.0
1996	6,372.20	2.8	441.1	6.9
1997	6,657.50	4.5	429.2	6.5
1998	6,947.20	4.4	441.9	6.4
1999	7,169.90	3.2	478.7	6.7
2000	7,345.70	2.5	475.0	6.4

Source: Elaborated on the basis of official statistics (Contraloría General, 1999 and 2001).

According to the Ministry of Agricultural Development (MIDA), the agricultural sector employed approximately 203,000 people, which is equivalent to 26% of the economically active population and 45% of the working rural population. On the other hand, according to the National Report on Human Development 2002, 40.5% of the population of the country was classified as poor in 2000, and 64% of them lived in rural areas (PNUD, 2002:84).

The situation of natural resources, mainly in the areas where rural poverty is concentrated, is characterised by loss of biodiversity, deforestation, badly planned urbanisation and alteration of hydrological regimes. Some indicators of environmental degradation, which were presented in the annual report of 1998 on Human Development by the PNUD, are relevant. Forest and woodland occupy about 37.6% of the national area. The annual deforestation ratio is 2.2%, while the average annual ratio for the previous decade was 9%. According to this report Panama holds the fourth place in terms of deforestation, when compared to other Central American countries (PNUD, 1998).

During the last few years, the policies for intervention in Panamanian agriculture have been modified. The most important changes in public policies for the rural sector are:

- reduction of credit portfolios;
- elimination of subsidies;
- reduction of tariff barriers;
- establishment of sanitary and quality barriers;
- opening to imports; and
- privatisation of some support services.

Supported by the IICA and other multilateral regional organisations,[14] MIDA is implementing the Panama Rural Plan 2001-2004 (see Box 2.1). In fact, this plan translates the New Rurality

[14] Along with the Inter-american Development Bank (IDB), the FAO, ECLAC, IFAD, the World Bank and GTZ, IICA is a member of the Interagency Group on Rural Development in Latin America and The Caribbean. This group 'supports' the national government *"to translate the New Rurality paradigm into policies, programs and specific*

Approach promoted by IICA into Panamanian circumstances, focusing on three components: "*competitiveness of agricultural and rural production, equity in the rural sector and the creation of a new rural institutionality"* (MIDA, 2001a:3, see also IICA, 2000).

Box 2.1 **The Panama Rural Plan 2001-2004**

Objectives:
- To improve and to deepen the insertion of the country into the international markets;
- To technically improve and to professionalise agricultural, cattle and forest production and agro-entrepreneurial development;
- To improve the public capacity to support sectorial development;
- To induce a gradual and supervised transfer of public services;
- To reinforce the contribution to the national rural development of women, young people and Indian communities.

Components:
- Competitiveness of agricultural and rural production;
- Equity in the rural milieu;
- New rural institutionality.

Programs:
- Fund for competitiveness and technological innovation;
- National fund for sustainable rural development;
- Institutional transformation and professional reconversion program for the new rurality;
- Strategic alliances program towards a new rurality;
- Commercial negotiation program;
- National bio-safety and agricultural sanitation program.

Source: MIDA, 2001a

Despite the politically and socially correct discourse of the Panama Rural Plan, it is now evident that rather than strengthening public sector capacities, the plan is creating new private organisational configurations for rural intervention. Indeed, most of the programs are implemented through the participation of consulting firms and NGOs. Moreover, the proposal for the management of the newly created funds within the Panama Rural Plan, is to create private foundations, such as COMPITA Foundation, whose directorate will be appointed by the Minister of Agriculture (MIDA, 2001b).

2.2.1 Organisational support for RR&D efforts

The governmental support service for agriculture plays a fundamental role in the agricultural transformation processes. MIDA as the governing organ of agricultural policy and the decentralised public agricultural organisations - IMA, BDA, ISA and IDIAP - together form the agricultural public support sector. The main public institutions in charge of agricultural research are IDIAP and to a lesser degree, the Faculty of Agrarian Sciences (FCA).

Traditionally, the studies of RR&D organisations and their institutional configurations have emphasised the National Agricultural Research Organisations (NAROs), Agricultural Universities and public extension programs. Moreover, in this research, I also found producer organisations, agricultural input sellers, private companies, national offices of regional S&T organisations, private universities and non-governmental organisations which also do research and work on the validation of agricultural technologies at a commercial level.

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actions in the countries" as part of the guidelines for a Common Agenda for the Community of Agriculture and Rural Life of the Americas (IICA, 2002:7).

It is important to stress here that producer organisations are adding new activities to their traditional functions. UNPAP has received two million US dollars as a donation from IDB, to carry out a series of studies related to Panamanian agriculture. APEMEP is carrying out a project funded by the European Union for more than six million euros and another one funded by Spanish International Co-operation Agency (AECI) and the Japanese International Co-operation Agency (JICA). Both projects include an R&D component.

Despite efforts in the past to create a National Agricultural System of Science, Technology and Innovation, this 'system' has not been realised. From my analytical perspective, it is possible to observe not so much a 'system' as several organisational configurations that co-exist and do not necessarily maintain formal links with each other. In these configurations, RR&D organisations with common characteristics are linked. It is possible, for example, to perceive a permanent *pattern of relationships* among technology development organisations of the agricultural public sector, co-ordinated by MIDA and the National Secretariat for Science & Technology (SENACYT). These organisations together form an organisational configuration.

On the other hand the educational organisations together form another configuration with permanent relations and co-ordination. The universities, both public and private, for example have a mechanism for articulation called the Council of Rectors. Some universities have established strategic alliances and develop joint educational programs. Based on its specific weight in higher agricultural education, the FCA has, until recently, carried the leadership of this configuration. Nevertheless, the City of Knowledge (CDS) is being outlined as a much more appropriate platform and is quickly taking over this position of leadership (see Box 2.2).

Box 2.2 **The City of Knowledge (CDS)**

The CDS is quickly becoming a consolidated platform for the development of activities of Science, Technology and Innovation, on both the national and regional scales. CDS is an international complex of academic, research, technological development, industrial and cultural organisations, which converge within a context of promoting the generation, dissemination and use of knowledge for achieving integral human development. The CDS' headquarters is situated in the former USA military base, Fort Clayton, at the Pacific entrance of the Panama Canal. CDS is under the direction of the City of Knowledge Foundation, a private, non-profit foundation created in 1995. It is directed by a Board of Trustees comprising representatives from the academic, business, labour, and government sectors. The City of Knowledge offers opportunities to:

- promote concerted actions among different disciplines, development sectors, and cultures, through the establishment of inter- and cross- disciplinary associations;
- approach, from one of the most intense cultural exchange centres in the Americas, the problems of shaping New World visions, from a perspective of a commitment to the fundamental values of culture and human development; and
- study and develop an understanding of the complex dynamics of tropical ecosystems and their interactions with human activities.

CDS promotes interdisciplinary activity among different areas of emphasis, so that institutional efforts can be co-ordinated, in order to achieve a better understanding of the problems and to make better use of opportunities for the generation and utilisation of knowledge. CDS intends to become a "Free Knowledge Zone**"** using Panama's advantages in priority areas, and its links and associations with local and international institutes of excellence.

Source: CDS, 2000.

Recent initiatives, such as the creation of the Hemispheric System for the Development of Higher Agricultural Education (SIDHEA), should support the fortification of this configuration at a national level and project it at a regional level. The SIDHEA is a regional network sponsored by IICA, which has defined its purpose as: "*to contribute to institutional and academic*

improvement of Agricultural Education Organisations in America", through support to "*institutional change, curriculum development, self-evaluation processes and processes for the improvement of quality and relevance*" (SIDHEA, 2000:3).

The national producers' organisations together form another organisational configuration, in which a representative of each organisation in turn takes on the leadership of this configuration. Representatives of this configuration have occupied the portfolio of Minister of Agricultural Development in the last 10 years. The present Minister was president of UNPAP, ANAVIP and ANDIA in the recent past.

There are many links among local and national RR&D organisations with global and regional actors - multinational organisations and transnational corporations. Actually, many global actors decide the principles, objectives, strategies and institutional policies of their corresponding national actors.

To give some examples, the National Association of Agricultural Input and Machinery Suppliers (ANDIA), (see Box 2.3), has links with the Latin American Crop Protection Association (LACPA) and via it with the Global Crop Protection Federation (GCPF). Actually there are no substantial differences between the mandate, objectives, politics and strategies of these three linked organisations.

Box 2.3 **National Association of Agricultural Inputs and Machinery Supplier (ANDIA)**

ANDIA is LACPA's and GCPF's national representative member, and promotes their mission in Panama. The main objective of ANDIA is: "to promote the understanding of the Crop Protection Industry's contribution to society and to co-ordinate an association membership network in order to achieve an effective representation of the industry in its relationship with national and national organisations". Among others, the following activities are accomplished by ANDIA:
(i) communicate and promote the crop protection industry's positions on key issues; (ii) emphasise the benefits of the crop protection industry in the production of high-quality food and fiber and its contribution towards the achievement of food security; (iii) promote the judicious use of crop protection products, especially through the implementation of Integrated Pest Management (IPM) and Integrated Crop Management (ICM) programs; (iv) provide scientific data and circulate reliable documentation and publications on specific issues, such as biotechnology, toxicology, resistance, residues, etc.; and (v) help the association members to comply with International Industry Standards concerning the manufacturing, formulation, packaging, labelling, transport, storage and disposal of crop protection products;

Source: ANDIA, 2000.

Another example of linkages among national, regional and global organisations is APEMEP, which is linked with the Central American Association of Small- and Middle-sized Agrarian Producers (ASOCODE) and therefore also with Via Campesina at the regional and global levels. The International Operational Secretary of Via Campesina, has its headquarters in Central America under the responsibility of ASOCODE, which co-ordinated and executed among others, the demonstration against the WTO in Seattle, Quebec and Genoa.

While the state has stopped being the most important actor in RR&D, new actors are emerging. One example is the Smithsonian Tropical Research Institute (STRI). Through the recovery of the Panama Canal this institute became the greatest 'private partnership' dedicated to scientific research in our country (see Box 2.4).

Box 2.4 **Smithsonian Tropical Research Institute (STRI)**

As an integral part of Smithsonian Institute, the STRI is the only one of its units based outside of the USA, with the mandate of "*increasing humankind's understanding of the world's tropics*".

Though Panama only occupies 0.05% of the world's land base, it is inhabited by more than 950 bird species, the equivalent of more than 10% of the known species. In its 75,517 km², an area equivalent to Austria, Panama contains four times more species of birds, eight times more species of reptiles and amphibians and three times more flower-bearing plants with than that country. On the island of Barro Colorado alone, with an area of only 15 km², more species of flower-bearing plants may be found than in all of Europe. More than 10,000 types of beetles and 16,000 types of butterflies and hundreds of species of freshwater fish can also be found in Panama. This singular biodiversity constitutes a challenge, as well as an opportunity, for those who study tropical ecosystems and their complexity. This has been one of the major tasks of the Smithsonian Tropical Research Institute (STRI) for more than 50 years.

STRI has a library and an inter-library network, with laboratories such as (i) Centre for Tropical Forest Science; (ii) Molecular Biology Laboratory; (iii) Centre for Tropical Paleoecology; (iv) Barro Colorado Island. Also, STRI possesses important biological collections: Herbarium, Seeds, Ants, Insects, Reptiles, Birds, Mammals, Marine Species.

Its specialised scientific and technical personnel is formed by 37 senior researchers as permanent scientific staff and 45 research associates. STRI has the status of 'international mission' and is funded mainly by the USA government and other international donors.

Source: STRI, 1999.

According to the data compiled by SENACYT and IDIAP (see Table 2.2), 46% of investment in R&D activities in Panama corresponds to investment in AgR&D. At the same time, the investment in agricultural research represents an average of 50% of the total investment in AgR&D.

Table 2.2 Investments in agricultural research in Panama (1990-1999)

Year	Investment in R & D (million B/.)	Investment in Ag R & D (million B/.)	Investment in agricultural research. (million B/.)	Intensity Ratio (% of AgGNP)
1994	28.3	15.1688	5.32	1.21
1995	30.0	13.59	6.50	1.49
1996	30.6	14.5044	5.50	1.25
1997	31.9	12.3134	6.00	1.40
1998	31.2	13.6032	6.15	1.38
1999	20.0	7.77	6.50	1.38

Source: Elaborated on the basis of official statistics (SENACYT, 1999; IDIAP, 2000a).

In relation to the investment in agricultural research, the intensity ratio (Investment in Agricultural Research as a % of AgGNP) varied from 1.21% in 1994 to 1.38% in 1999. On average, for the period analysed, the intensity ratio in Panama is 1.35%, which is the highest in Latin America but lower than in developed countries.

The changes in the role of the key national actors in Panama, as all other changes, will affect the agricultural sector economically and politically. In the first place, the role of the state is changing from producer and supervisor to organiser and facilitator of the process of development of the agricultural sector. Second, the multinational companies already are leading the process of technological development in key areas, as in the area of biotechnology, in which privatisation of the process is growing rapidly. Third, consulting firms and non-governmental organisations (NGOs) are quickly occupying the space left by the state in several technical and social areas.

Finally, co-ordinated efforts exist to diminish the scope of public organisations and to enlarge the field of action of the private sector. The market is increasingly assumed to be an independent, neutral institution that is better able to think and decide than human beings. The privatisation of the services and resources associated with ecological services (like water) locally distributes the conservation costs among many while its benefits are appropriated by few private groups, who generally do not belong to the rural communities. Meanwhile, the crisis of values, local symbols and identities, the unemployment, the collapse of local agricultural markets, and the emigration and fragmentation of families are leading to the disintegration of the rural areas.

The previous paragraphs about the Panamanian rural sector indicate that special consideration must be given to the articulation of the national economy with regional and global economies, due to pressures of supranational actors who influence national policies.In the following section, I will analyse the regional - Latin American and Caribbean (LAC) - context.

2.3 The regional context

The global changes taking place (Hobsbawm, 1994; Thurow, 1996; Waters, 1995; Huntington, 1997) are deeply affecting the economic structure of Latin America and The Caribbean (LAC) in general (IICA, 1996), and their agriculture in particular (Ardila, 1997; IICA, 1997). LAC constitutes a depressed region of the world. Around 35% of the regional population live in conditions of absolute poverty. Numerous studies have been made considering the number of poor people in Latin America. While variations between these estimations exist, Echeverria (1998 and 2000) estimates that between 1980 and 1994, the number of poor people in Latin America has grown from 135.9 to 209.3 million; Garret (1995) found that the number of poor people living in Latin America between 1980 and 1990 grew from 120 million to 195 million people. The tendency shown by these data is sufficiently clear to emphasise the alarming rate of the growth of poverty in this context.

LAC maintains a level of population (8.2%), comparable to Western Europe (7.2 %), in relation to the worldwide total, but with a much greater basis of natural resources. LAC is characterised as being one of the regions in the world with greater agricultural potential. Its natural resources include 23% of the potentially arable, and 15% of the cultivable land in the world. It possesses 46% of the forested land, and 31% of the world's fresh water, and has been considered as part of worldwide strategies for food security in the next 25 years (Trigo, 1995).

The Latin American GNP, according to the Economic Commission for Latin America (ECLAC), accumulated an average rate of growth of barely 3.2% during the 1990s, which is below the 5.5% registered between 1950 and 1980. ECLAC recognises that this growth was insufficient to generate the jobs and the wages that the Latin American population demanded in that period. On the other hand, the same organisation calculates that, between 1990 and 1999, the number of unemployed jumped from 7.6 million in 1990, to 18.6 million in 1999 (CEPAL, 2001). Moreover, in the 2002 report, ECLAC confirmed that "*inequality and inequity have been perpetuated in most countries and have worsened in comparison with the developed world. Relative poverty has abated very little, and the number of persons who cannot even meet their basic needs has actually increased. As a result, the situation in the region is no more socially and economically sustainable than it was 10 years ago*" (UNEP & ECLAC, 2002:25)

In relation to the agricultural production in the region, some authors affirm that the sector has dynamised and modernised some of its activities, mainly those related to export. Agricultural products and by-products are an important support element in the LAC balance of trade. Of

every 100 US dollars of agricultural and agro-industrial products exported in the world, 36 are from the Americas; i.e., 16 dollars from LAC and 20 dollars from the USA and Canada (Ardila, 1999). At the same time, the production destined for the national market has lost importance as well as governmental support, and is now exposed to competition from imported products. This explains largely, why some countries of the region are becoming food importers; the food imported by the region grew by 12% between 1990 -1994 (IICA, 1999).

Also, the levels of poverty in the rural zones of LAC have been growing and worsening, since the small producers and farmers engaged in production for the internal market have been more or less excluded from participating in non-traditional exports. In addition, it has been calculated that at the end of the 1980s, around 19.5% of the surface of Latin America was suffering from problems caused by moderate to severe erosion (Trigo, 1995).

Under an economic and commercial perspective, the United States, Canada and LAC governments are currently negotiating the formation of a Free Trade Area of the Americas (FTAA). The FTAA is the regional expression of neo-liberal globalisation, which it tries to establish by means of an asymmetric process of integration, under the leadership of the Trans-national Corporations (TNC). Many see as its objective the reorganisation of economic factors and natural resources of the Latin American countries according to the interests of the North American corporate capital. This is expressed in the intention of: "*total and indiscriminate protection of the investments to the detriment of the sovereignty of the states*" (CCCB-CECC, 2002). As in the case of North American Free Trade Agreement, the states are losing their capacity to protect environmental and human health, and their citizens are denied the right to participate democratically in the determination of the course and priorities of development. "*These two mechanisms are clear reflections of the conviction of the U.S.A. that 'integration is equivalent to free commerce' with strong leadership from the private sector*" (Gratius, 2002).

2.3.1 Organisational support for RR&D efforts

Agricultural research & development organisations have since their creation, significantly contributed to the growth and diversification of agricultural production in the region (Machado, 1997). According to numerous studies, the investments made by public agricultural research organisations, starting from the 1960s, have generated significant excess, in addition to having paid the original investment several times. In addition, it explains up to 40% of the increase in agricultural productivity during this period (De Las Casas, 1997, Morales, 1999).

The LAC region is known for its prolific experience, structures, and configurations in agricultural research. In the 1940's, and even since the beginning of the last century in some cases, the first steps were taken towards organisation of agricultural research, with the appearance of experimental stations and some research and extension programs linked to universities. Later on, some of these stations were transformed into semi-autonomous institutes or National Agricultural Research Institutes, with the mandate of adapting and generating technologies to increase productivity in agriculture. This process was formally initiated at the end of the decade of the 1950's, when it was finally accepted that the region should develop its own capabilities to generate local technology and to adapt foreign technology. The first organisation to be set up as such was the National Institute for Agricultural Technology of Argentina in 1956.

Particularly at the regional level, LAC has several organisations and regional configurations get up for institutional support of RR&D efforts. Among these institutional actors, the IICA stands out, and CATIE and the Caribbean Agricultural Research and Development Institute also play an

important role. In addition, three international research centres associated to the CGIAR are located in the region; the International Centre for Improvement of Maize and Wheat (CIMMYT) in Mexico, the International Centre for Tropical Agriculture (CIAT) in Colombia and the International Potato Centre (CIP) in Peru. Other international centres located in other regions also do research in LAC countries, such as the Centre for International Forestry Research, the International Food Police Research Institute and ISNAR.

With regard to the sub-regional configurations for R&D, the emphasis goes towards programs of co-operation: the Co-operative Program for Agricultural Research in the Andes, the Co-operative Program for Agricultural Research in the South, the Co-operative Program for Agricultural Research in the Tropics, and the Central American Integrated System for Agricultural Research. Other networks and consortiums were created in the region, such as the Consortium for Sustainable Development in the Andean Ecoregion, the Meso-american Phytogenetic Resources Network, the Regional Co-operative Potato Program, the Program for Research on Basic Grains in Central America, the Regional Co-operative Bean Program, the Regional Corn Program, co-ordinated by CIMMYT, and the Co-operative Agricultural Research Support Programs, administered by American universities with funding from USAID. Recently, the Regional Research and Technological Development Forum - FORAGRO, was created. It includes public agricultural research organisations from all the countries of the Americas. It is a platform established by these countries and is supported by IDB and IICA, "*to promote and facilitate dialogue by public and private organisations in these countries and the region on topics that are critical for agriculture, from the perspective of technological innovation*" (FORAGRO, 2000:2).

More recently, the Regional Agricultural Technology Fund (FONTAGRO) was created, established initially by twelve countries with sponsorship from the IDB, IICA, the Canadian International Development Agency, and the Rockefeller Foundation, to finance research projects on problems common to the region. This fund was implemented by regional research consortia composed of both public and private organisations from two or more countries in the region, as well as regional and international research centres. FONTAGRO is funding projects such as genetic improvement, integrated pest management, fruit and vegetable production in agro-industrial systems, forest management, natural resources conservation, and institutional strengthening and design of agricultural policies.

Integrated in this organisational matrix for RR&D, nearly 100 national agricultural research organisations exist, with more than 12,000 researchers and an annual investment of more than 1,200 million US dollars (ISNAR, 1998).Within this complex regional network, the private sector's participation is not yet very representative. In addition, there are about 11,000 non-governmental organisations (NGO) that act in the rural milieu, combining agricultural activities with social and economic development. European and US donors fund these organisations, (Inter-American Foundation, 1990, cited by Arrosi *et al*., 1994).

According to data from IICA (Mateo *et al*., 1999), in the periods 1981 - 85 and 1991 -93, investment in the region in research decreased by about 10% in real terms. This situation has been even more critical for the poorer sub-regions such as Central America, where the decrease amounted to 47.4%, and 21.9% in the Andean region, whereas in the Southern Cone it decreased by only 3.1% in the same period. This reduction in investment has also weakened training programs for new researchers, and has seriously affected the ability to produce results, especially in the public sector, which still represents 70% of total investment in agricultural research in the region, with the remaining 30% corresponding to the budgets of private organisations, universities, and international centres located in the region.

Nevertheless, all this structure and capacity for R&D are under the combined impact of the global and regional changes in progress and their respective tendencies. The implications for the organisations of the institutional matrix associated with agricultural science and technology in the region are impressive (IICA, 1996; Ardila, 1997; IICA, 1997). Today, these RR&D organisations are facing an immense challenge to achieve accelerated transformation and modernisation so as to bring about reorientation towards the new priorities and agendas, coming from agriculture and agribusiness in general, in the midst of a growing process of capitalist globalisation and an opening up of the economy. The creation of sub-regional economic blocs has been stimulated under the marketing worldview, which emphasises market mechanisms and strongly influences the national policy-formulation and decision-making processes.

2.4 The global context

Worldwide, the agriculture of the future will have great difficulty in combating hunger (Alessandratos 1995) because the problems of distribution cannot only be solved by production technology or by the market. While in some regions and countries of the world, food production is deficient it is also true that the world already produces more food than the worldwide population is able to consume (FAO, 2001). However, the present distribution of income on a worldwide scale still prevents easy access to food even when the price is low. The wealthiest 20% of the world population receive 83% of the Gross Worldwide Product, while 1.2 million people has to survive with less than 1 US dollar per day (Boron, 2001).

The autonomy of the nation-state to decide on the nature and the course of development of its society has diminished drastically, mainly in the developing countries affected by worldwide economic contraction, the weight of external debt, and the creation of supranational organisations (WTO, IMF, etc.). As a result, the definition of national policies is now strongly influenced by supranational actors (Griffin & Rahman, 1992).

Also, with the creation of the World Trade Organisation (WTO), agriculture is being incorporated into the global economic matrix. "*The global*" is replacing the national centres of decision, while transnational corporations and supranational organisations influence global decisions as much as local decisions (Busch, 1994).

Additionally, several scientific revolutions are taking place as Busch puts it: *"our world is changing substantively through the development of (1) biotechnologies, (2) information technologies, and (3) nanotechnologies* (Busch, 2001:1). In particular, the bio-revolution astonishes the world with the possibilities of genetic engineering. There is also a fast decline in the value of unprocessed products and a very sharp increase in the value of processed products. The concentration of land property, the diminution in the number of small- and medium-sized farmers and the decline of prices for agricultural products are consequences of the "*agricultural treadmill*" (see Figure 2.1) (Cochrane, 1958).

As Röling (2002) put it: "*when the treadmill runs well at the national level in comparison with neighbouring countries, the national agricultural sector improves its competitive position. It is very understandable that policy makers have grasped the treadmill as the fundament for agricultural policy. It represents market forces in optimal form. A final advantage is that the treadmill will continue to work on the basis of relatively small investments in research and extension*" (Röling, 2002:13).

Many small farms all produce the same product;

Because not one of them can affect the price, all will produce as much as possible against the going price;

A new technology enables innovators to capture a windfall profit;

After some time, others follow;

Increasing production and/or efficiency drives down prices;

Those who have not yet adopted the new technology must now do so lest they lose income;

Those who are too old, sick, poor or indebted to innovate eventually have to leave the scene. Those who make the windfall profits absorb their resources.

Figure 2.1 The agricultural treadmill (adapted from Cochrane, 1958 and Röling, 2002).

Röling (2002) has also pointed out the negative consequences of the agricultural treadmill:

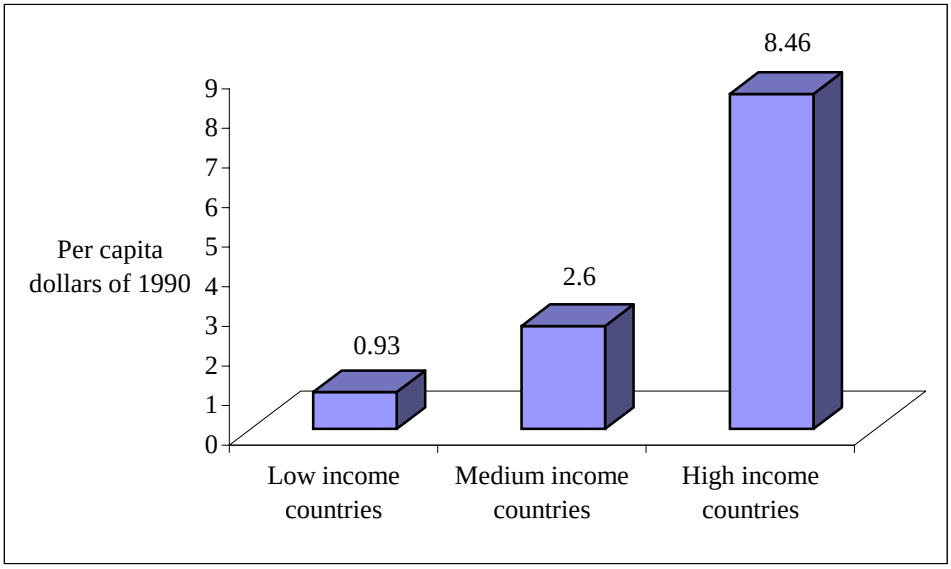
- "*Not consumers but input suppliers, food industries, and supermarkets capture the added value from greater efficiency. Large corporations are well on their way to obliterate competition in agriculture. Only small- and medium-sized farmers are squeezed.*
- *The advantages of the treadmill diminish rapidly as the number of farmers decreases and the homogeneity of the survivors increases.*
- *The competition among farmers promotes non-sustainable forms of agriculture (use of pesticides and hormones, loss of bio-diversity, unsafe foods, etc.). The treadmill is contradictory to nature conservation, drinking water provision, landscape conservation, and other ecological services.*
- *The treadmill leads to loss of local knowledge and cultural diversity.*
- *A global treadmill unfairly confronts farmers in very different stages of technological development, and who have very different access to resources. The global treadmill prevents farmers in developing countries from developing their agriculture and denies them purchasing power at the same time. This effect is only exacerbated by subsidies paid to farmers in the North to overproduce.*
- *The Treadmill leads to short-term adaptations that can be dangerous for long-term global food security. But it does become evident that the treadmill does not support the contribution to global food security of the most productive agricultural areas in the world. There are those who say that organic agriculture cannot feed the world. I think it is more relevant to say that one cannot feed the world as long as the treadmill is in operation*" (*ibid.*:14).

At the moment, it is accepted that in both developed and developing countries, economic growth will be affected when agriculture is neglected. While the multinational agencies are promoting the elimination of subsidies and tariff barriers and the privatisation of agricultural research and

extension services in developing countries, not one developed country could develop its agriculture without subsidies and tariff barriers.

Moreover, as OXFAM put it, "*the Uruguay Round, and the wider process of trade liberalisation to date, has not been a fair deal for developing countries. Industrialised countries have levered open markets in developing countries, often with high social costs, while keeping their own markets protected against developing-country exports. UNCTAD has calculated that rich-country trade barriers cost developing countries US $ 700 billion every year"* (OXFAM, 2001:2).

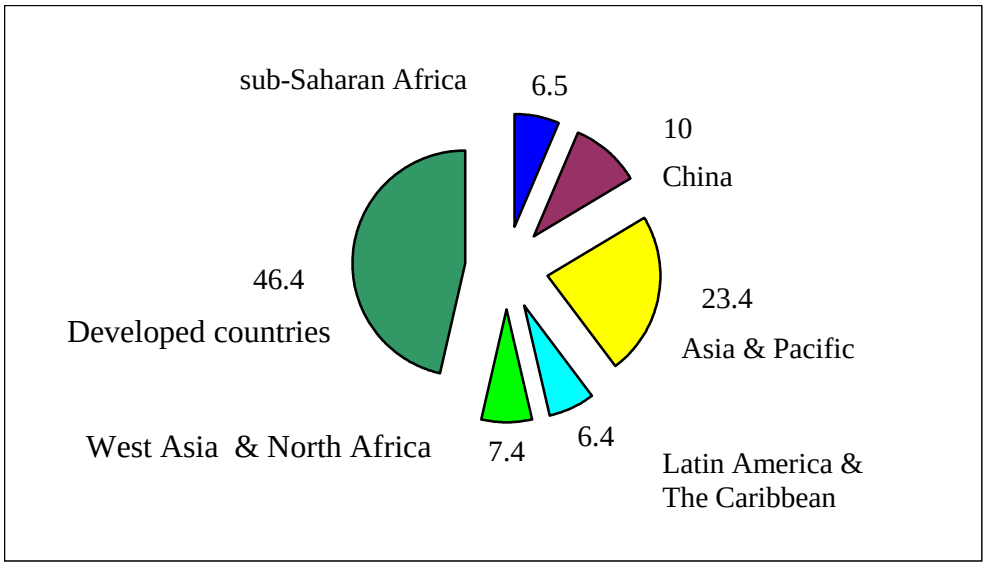
At the same time that multinational agencies are recommending the privatisation of public support services, developed countries are strengthening theirs. This is evident when we compare the investments in agricultural research in countries with a different level of income. We can observe in Figure 2.2, that developed countries spend almost ten times as much on agricultural research as the low-income countries do and they spend more than 3 times as much as the medium-income countries do.



Source: adapted from Morales, 1999.

Figure 2.2 Investment in agricultural research by national level of income

Global agricultural research expenditures (excluding the former USSR and Eastern Europe) increased between 1971 and 1991 from an estimated 7.3 billion to 15.0 billion constant 1985 US dollars (ISNAR, 1998). This meant more or less a doubling in real terms. However, the regional shares in the global total show an asymmetric distribution of public investment in agricultural research. As we can see in the data of Figure 2.3, the developed countries lead public investment in agricultural research with 46 % of the total, followed by China and Asia & Pacific with 23 and 10 % respectively.



Source: Elaborated on the basis of ISNAR statistics (ISNAR, 1998)

Figure 2.3 Regional distribution of global expenditures in agricultural research in 1991

2.4.1 Organisational support for RR&D efforts

The only formal global mechanism for articulating public R&D organisation is formed by a set of international centres for agricultural research co-ordinated by the Consultative Group for International Agricultural Research (CGIAR) (Bonte-Friedheim and Sheridan, 1997). Currently, a majority of the eleven centres comprising the CGIAR are involved in a deep crisis. The crisis of the international centres of agricultural research is intimately related to the crisis of the techno-centric paradigm of science, especially with regard to the rigid, mechanical and linear approach to generating knowledge dissociated from the context of its application and without the participation of social actors affected by the application of that knowledge.

In order to complement the classic mode, the limitations of some of its premises must be surpassed by an emerging new mode of knowledge generation, whose characteristics include: (i) the generation of knowledge in the context of its application; (ii) the social appropriation of knowledge during the process of its generation; (iii) the trans-disciplinary and inter-institutional effort for the interpretation and handling of complex problems; (iv) the incorporation of ethical principles in interaction with society and nature; and, (v) extended social control on the quality of the knowledge and the validity of its impacts (Gibbons *et al.,* 1994*).*

Thus, while the classic mode propagates its methodological neutrality and the inconvenience of the interaction with the context, the emergent mode is centred in the context and chooses the interaction as the only appropriate strategy to understand the web of relations moulded by the different perceptions, decisions and actions of the actors in rural development.

At the same time, the transnational corporations (TNCs) are already the more powerful economic actors influencing political decisions. They are reconstructing agriculture in general and in particular the processes of technological development and innovation (Bonanno *et al*., 1994; Michael, 1994). According to Busch, "*.. the world of agricultural research can no longer be thought of in merely national terms. Research is now a global activity involving not only nation-states but also large transnational actors…*" (Busch, 1994:80).

One of the examples is the GCPF that is the recognised worldwide representative of the crop protection industry. This industry includes the major manufacturers, formulators and distributors of pesticides (herbicides, insecticides and fungicides), agrochemical and biotechnology products. Its network comprises six regional associations (Africa & Middle East, Asia & Pacific, Europe, Japan, Latin America and North America), national crop protection organisations in each country, individual companies and technical advisors (GCPF, 2000).

Another important network is part of the so-called 'third sector', formed mainly by NGOs. As a result of the change of the role of the state in the economy and the privatisation of public services, NGOs are reassessing their mission, defining elements of their sustainability strategies, and redefining the role they will play in public policy and society as a whole. Therefore, many of them are concerned with the foundations of the organisation's legitimacy, the pertinence of their products and services, and their relations with other actors in the area of rural resources management. As Fowler stated, "*today, NGOs are confronted with a new global policy agenda for international development assistance that presents opportunities, threats and instability as old assumptions become invalid and rules of the game change*" (Fowler, 1997:xiii).

The above-described situation of the RR&D context confirms the transcendental on-going global, regional, national and sectoral changes. These changes do not belong to the current epoch, indeed, they are changing the epoch. As Mato *et al*., put it, "*the genesis of the current change of epoch is strongly associated with three revolutions - the socio-cultural, economic and the technological one - whose crossed impacts are changing the system of ideas, the system of techniques and the institutionality of the historical epoch of industrialism*" (*ibid.*:17). This change of epoch is generating uncertainty, discontinuity, instability, fragmentation, insecurity, and perplexity, in sum: vulnerability. Organisational vulnerability has deep implications for the institutional configurations of RR&D at regional and national levels. The following change processes deserve special attention:

- the dominant role of economic global institutions (WTO, IMF, WB) over the political ones (UN, UNESCO, WHO) to establish a new regime of capital accumulation under the logic of capitalist globalisation (Borón, 2002);
- decline of nation-state sovereignty, with a corresponding rise in the power of transnational corporations, multilateral agencies and agreements, and supranational organisations (Bonanno *et al*., 1994);
- rise of the "network logic" for organising intervention at a global scope (Castells, 1996; Capra, 2002); and
- new forces are emerging in opposition to capitalist globalisation, due to the increasing lack of social satisfaction and the desire of civil society actors to participate in the processes of policies and priorities, which will affect their development.

2.5 Conclusions

The above characterisation of the context of institutional innovation can be summarised as follows:

- Agriculture and the rural sector are fundamental components with a view to the socio-economic development of Panama and other countries in LAC.

- The development of agriculture and the rural sector in a globalised economy depends strongly on technology[15]. Creating and maintaining technological capability requires investment that depends on political decisions and proper management. Nevertheless, the domination of technological determinism without consideration of the human, social and ecological, and institutional dimensions of rural change is jeopardising the RR&D effort.

- The market fails when it comes to providing farmers with a sustainable livelihood. Even the most productive agriculture fails to support sustainable farming communities. Modern, 'developed' agriculture increasingly comes into conflict with other resource users about the use of rural resources, such as fresh water, clean air, soil, biodiversity, rural landscapes, etc.

- The world's resources are not sufficient to provide every inhabitant of the globe with the kind of (unhealthy) diet of processed food that is eaten by the majority in industrialised countries, and is promoted by the global corporations. The earlier focus on abundance of fat, animal-based, processed foods has given way to a focus on health; i.e., less fat, less meat, and more fresh vegetables, fruits and fibres.

- A greater participation of Latin America in the international market generates both pressures from technological and institutional innovation; and, a constant adaptation of the RR&D organisations to the context in which they operate. The "*new institutionality*", which has been constructed within the region, has been influenced by the institutional coherence of capitalist globalisation.

- The reduction of public investment in technological development, the decline of public sector budgets and the increasing role of the private sector (including the NGOs) in the process of defining of sectoral public policies have no official opposition within the regional institutional configuration, which is intended to support RR&D efforts.

- A powerful regional social movement (like Via Campesina, ASOCODE, and consumer organisations) are struggling to develop solidarity and unity in the diversity among small farmer organisations, in order to promote economic relations of equality and social justice; the preservation of land; food sovereignty; and sustainable agricultural production.

- While the international agricultural research centres (CIAT, CIMMYT, CIP) in LAC have lost credibility and pertinence in the knowledge-generation process, the newly created regional forum - FORAGRO - is emphasising the same linear, mechanistic and even reductionistic approach that it is expected to overcome.

- More than in a system, RR&D organisations are organising themselves into a network, which links national with co-operative regional, sub-regional and global actors.

- Finally, while the main protagonists of Green Revolution used to be the International Agricultural Research Centres, today the principal protagonists of current bio-revolution are the transnational corporations. Global corporations are destroying the 'free competitive market' in agriculture, especially in industrial countries; in developing nations, they destroy farming even before it has had a chance to begin developing.

[15] Technology here is conceptualised broadly, to means the application of knowledge (scientific or not) for the accomplishment of practical tasks through ordered systems that involve people, other living beings, organisations and machines (Street, 1992). Under this concept, Integrated Pest Management, a mechanical harvester, an organisational model or system, are technologies as well as the design and management of participatory processes.

Given these conditions, a radical shift is emerging in the thinking about agricultural innovation.

- The goals of productivity and competitiveness are no longer accepted as the unquestionable goals of farming. Instead, these goals have increasingly become contested in trade-offs with sustainability, equity, food sovereignty and poverty reduction.

- The increased vulnerability and uncertainties created by the change of epoch and the effects of neo-liberal globalisation are beginning to override the market as the 'driving force' of rural development.

- Agriculture is increasingly seen as only one of the stakeholders in an intense struggle for the future use of fresh water and other rural resources.

Under these conditions, innovation in agriculture is no longer the outcome of applying a science focussed on delivering 'the best technical means' to achieve the given goals of productivity and competitiveness. Instead of just being the product of fundamental and/or applied research by agricultural scientists, innovation is increasingly seen as the emergent property of the interaction among stakeholders in 'theatres of innovation' (Engel and Salomon, 1997; Röling & Wagemakers, 1998). These stakeholders include researchers, extension workers and farmers, but also increasingly, concerned NGOs, other resource users, consumers, industries, among others.

This means for policy-makers, innovation managers and rural development practitioners, that the attention must shift from emphasising only technological innovation, to careful understanding of the contexts and actors in innovation processes, and to facilitation of desirable interactive processes towards a major institutional innovation for existing RR&D organisations.

In the next chapter, the current 'state of the art' of institutional innovation is presented.

Chapter 3. The State of the Art of Institutional Innovation

3.1 Overview

How we see the world determines to a great extent how we act in it. Our capacity to see and to understand the world is constructed by our experiences and shaped by the means of socialisation constituting itself in the value framework through which we see, sort out and attribute meaning to the world around us. This mental framework, is what has been called worldview or ***"Weltanschauung***" (Checkland, 1989; Wilson & Morren, 1990; Bawden, 1998, 2001). Wilson & Morren pointed out that worldviews: "*consist of the experiences, feelings, emotions, attitudes, values, morals, belief, tastes, and personalities of individuals, as well as their patterns of reasoning and intelligence and their store of knowledge*" (Wilson & Morren, 1990:41).

For that reason, an institutional change - change in the rules of the game - of a given organisation is impossible without a deep change in the way of thinking, which influences the individual and organisational mental frameworks that mould the collective perception, decisions and actions within these organisations.

These rules of the game are the result of a long historical process of social construction and, as such, may often slow down the change in the value frameworks except when the change reinforces the existing institutional coherence. Therefore, when the rules of the game change, it is the result and the very expression of the changes in mental frameworks.

So, if we want to strengthen RR&D organisations through processes of institutional innovation, we must reflect critically on their dominant worldviews and theories of action, which inform their modes of intervention, *organisational praxis*, and analyse their internal coherence and correspondence with the new emergent realities.

This chapter provides the review of the state of the art of institutional innovation in general as well as of RR&D organisations in particular. First, the distinction between organisation and institutions as well as the notion of the degree of institutionalisation are introduced. Second, the major theoretical developments that characterise the passage from organisational management to organisational learning are reviewed. Then, the key theoretical perspectives for institutional innovation in public and not-for-profit organisations are presented. Finally, the main approaches for institutional innovation in RR&D organisations are discussed.

3.2 Organisations and institutions

All organisations are not necessarily institutions. For example, 'money' is an institution, but it is not an organisation; the central bank of a country is simultaneously an institution and an organisation; and a decentralised branch of a bank, located inside a country, is an organisation, but it is not an institution (Uphoff, 2000). Formal and informal, money is an institution because its use implies following a group of rules that is practised by a great number of people, whose perceptions, decisions and actions are affected by this set of rules of the game.

The central bank of any country is simultaneously an institution and an organisation, because it generates a set of rules of the game, that must be followed by an ample number of people; at the same time it is constituted by an organisational architecture and is integrated by a set of individuals distributed within a functional and spatial structure. The decentralised branch of a given bank provides services and does not generate rules because it follows the rules generated by the central agency, and is therefore an organisation, but does not constitute an institution.

While organisations are "*structures of recognised and accepted roles"* (Uphoff, 1995:184), institutions according different authors are: *"set of rules and norms that constrain human action"* (North, 1990: 3);*"complexes of norms and behaviour that persist over time by serving collectively valued purposes*" (Uphoff, 1995:184); "*sets of rules, decision-making procedures, and programs that define social practices, assign roles to the participants in these practices, and guide interactions among occupants of individual roles"* (Young, 1994:3); and "*cognitive, normative, and regulative structures and activities that provide stability and meaning to social behaviour"* (Scott, 1995:33).

What differentiates institutions from organisations is the degree to which they have incorporated in a coherent way into their daily action worldviews, values, culture, beliefs, rituals, myths, symbols, assumptions, paradigms, premises, theories, etc. - rules of the game - that constitute the essential part of their identity. In addition, the institutional dimension of organisations must have internal consistency between its mode of interpretation of reality and its theory of action to transform it.

From this understanding, all development organisations are simultaneously an organisation and an institution: they have an institutional dimension and an organisational one that should not be confused. With their rules (of the game) for development these organisations influence the perceptions, decisions and actions of those who constitute the organisation and of most of the social actors in the context in which they act. The rules, both formal and informal, include worldview, values, theories, beliefs, principles, premises, approaches, models, paradigms, policies, mission, strategies, priorities, objectives, norms, etc.

The organisational dimension corresponds to its material infrastructure and resources, the respective space distribution of that infrastructure and material resources, the set of human beings who integrate them and the functional stratification that assigns roles and functions to these people in the material space of the organisation.

The institutional dimension of RR&D organisations (their rules of the game) is defined through ethical and political decisions in relation to their worldview, the way knowledge[16] is generated, shared and appropriated and in the mode of intervention. It is made explicit in the way the rules of the game are expressed in their guiding principles, values, norms and frameworks (conceptual, philosophical, methodological and operative).

[16] Data are not information and information is not knowledge. Data are a sequence of events or symbols, numerical or not, still devoid of interpretation, articulated in a certain order and form, that allows us to answer questions of the type "what?". Information is the meaning set derived from the data, through an interpretation that contextualises the existing relations among them and which displays them like organised topics, allowing us to answer questions of the type "how?". Knowledge is the product of an individual or collective effort to (re)interpret, (re)configure, (re)combine and (re)order old and new data, information, values and intentions with the deliberate objective of extending or of improving the capacity to be effective in the domain of existence. (Bell 1999, Maturana & Varela in Capra, 1996).

Therefore, instead of the binary distinction between organisation and institution, I am proposing a more continuous concept of **degree of institutionalisation**. RR&D organisations have different *degrees of institutionalisation*, depending on how they have defined, made explicit and practised their rules of the game, mode of interpretation and theory of action. This does not mean that they do not have them at all. These elements of their institutional dimension may be consciously implicit, or RR&D organisations are just followers or imitators of more institutionalised actors.

3.3 From organisational management to organisational learning

Organisational management and its role in the performance of organisations has been the object of valuable studies on the part of important classic and contemporary thinkers. These studies have been influenced by two main approaches: on the one hand, Frederick W. Taylor developed a 'scientific approach' for the interpretation and handling of the organisations whose premises were derived from rationalist logic. On the other hand, George Elton Mayo, from the University of Harvard, proposed a 'humanist approach' with the same purpose, because for him certain social and behavioural factors were key to the increase in productivity in organisations. Recently, an increasing effort of synthesising of these two approaches exists.

The "*scientific management*" of Taylor. Taylor (1915) decided to replace the traditional rules that influenced the development of the working place within organisations by a new type of knowledge that allowed him to identify the "*one best way*" of doing a job through the study of the time and movements involved in such process. Under the influence of the mechanical worldview, *scientific management* consisted of transforming the tacit knowledge of the workers into scientific objective knowledge. Obviously, this initiative did not consider their experiences nor the workers' capacity to judge as important sources of knowledge. The managers would have to learn to classify, process and reduce the tacit knowledge of the workers into rules and formulas that could be applied in the most efficient way. In this context, the workers were reduced to mere pieces of mechanical gear, without either imagination or creativity. In his effort to find the "*one best way*" to organise and to control the work, Taylor generated at the beginning of the twentieth century some principles that still influence the dynamics of most of the industries and bureaucratic organisations today.

The main recommendations derived from the principles of Taylor are:

- *to dissociate the process of work from the workers' knowledge;*
- *to separate the job conception from it execution;*
- *to monopolise the knowledge to control each step of work's process and its way of execution;*
- *to select the best worker to complete the programmed task;*
- *to train the selected worker to efficiently complete the programmed task; and*
- *to supervise the performance of the worker* (Taylor, 1915).

The "human management" of Mayo. Mayo (1933) defended the idea that human beings were "*social animals*", and if so, they would have to be understood in the context of their own social group. For Mayo, managers would have to develop social human abilities to facilitate interpersonal communication within the formal and informal groups of the organisation of the work. With this, Mayo initiated the development of his theory of human relations that emphasised the relevance of social factors to the increase in labour productivity, through the continuous improvement of workers' practical knowledge. According to social human relations, workers had to be considered as more than hands; workers also had a heart, (i.e. feeling and

attitudes) that affected productivity. This theory of Mayo's was not developed to the point that could be well differentiated from that of Taylor. For that reason, it was later absorbed by other 'scientific' theories on human groups and social interaction, such as "*group dynamics*" and "*operational behaviour*" theories.

By the second half of the twentieth century, many scholars converged on the idea that there was no "*one best way*" to manage. Instead, they tried to identify which variables would be successful for a particular situation. Herbert Simon (1960 and 1982) developed a vision of organisations as "*machines to process information*". Under this vision, organisations are social systems in which individual decisions are the basis of human behaviour. They extract structures of meaning from information captured through the sensorial organs, and store these meanings as new knowledge or use them to decide courses of action. Simon popularised the premise that the world is great and complex, while the human brain and its capacity of processing of information is limited. Simon considered that the number of variables our brain can handle, the time available, and our reasoning power limits our decisions; he called this "*bounded rationality*" (Simon, 1982).

In the discussion on the concept of a "*knowledge society*", Peter Drucker (1955, 1970 and 1985) suggested that the future organisations' sustainability will depend on their capacity to develop systematic practices for the management of processes of self-transformation. Nevertheless, Drucker did not propose the social technology through which these organisations would manage to capitalise on the tacit knowledge whose importance he seemed to recognise. Peter Senge (1990 and 1994) presented a proposal for the development of *"learning organisations*", but as the knowledge is generated in the organisations, he seemed to suggest that they must learn from the already existing knowledge. Senge's "*five disciplines*" are the keys to achieving this type of organisation: personal mastery, mental models, shared vision, team learning, and systems thinking. According to Senge *et al*, learning organisations are organisations in which people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together (Senge *et al*., 1994).

Ikujiro Nonaka and Hirotaka Takeuchi (1995) from the University of Hitotsubashi, Japan, have developed what seems to be to date the most articulated theory of the creation and management of innovative knowledge within organisations. Without the limitations imposed by the Cartesian dualism, this theory articulates: (i) the possibility of generating knowledge at the levels of the individual, group, organisation and inter-organisations; and (ii) the emergence of new knowledge through the transformation of tacit knowledge into explicit knowledge ("*externalisation"*); explicit knowledge into tacit knowledge ("*internalisation"*); tacit knowledge into tacit knowledge ("*socialisation"*); and explicit knowledge into explicit knowledge ("*combination"*) (Nonaka and Takeuchi, 1995).

Explicit knowledge is the formal knowledge that can be found systematised and available in different forms: data, formulas, codified procedures, universal principles, general rules, standardised procedures, written texts, etc. The books, documents, information, advanced training courses, lectures and conferences are the most common means to facilitate the access and transference of explicit knowledge. (*ibid.*) 1995).

The formalisation and systematisation of explicit knowledge are its strengths because they facilitate its access and transference, but they are also its weaknesses because they pass the impression that this is the only type of valid knowledge. The formalisation and systematisation create a perception of knowledge that ignores the importance of informal tacit knowledge, which

the local actors have about their context and about the dynamics of the micro processes that comprise the their daily personal and professional activities.

Tacit knowledge is informal knowledge, personal or social, difficult to express in a systematised form; it is "*not easily visible and expressible"*, difficult to even share by the traditional means that actors within the organisations have. It is "*deeply rooted in an individual's action and experience, as well as in the ideals, values, emotions he or she embraces*" (*ibid.*:8-9). Intuition and imagination are two of the most important ingredients for the generation of this type of knowledge. Tacit knowledge is a product of the interaction between individuals or groups in the context of the networks of relations and the chains of events that they influence in their daily work, that are influenced by the perceptions and actions of these actors as well.

Tacit knowledge can also be split up into its technical and cognitive dimensions. The technical dimension, related to skills and crafts is translated through the expression "*know-how*" of a person or an organisation. The cognitive dimension includes the mental models, beliefs, values, schemes and perceptions that influence the way actors think and act, which reflects their image of "*what is*" and "*what ought to be*" the reality. The main characteristic of tacit knowledge is that its access is impossible without the direct and personal interaction with the actors who have it, because its transfer depends mainly on the creative effort to express it through verbal images, metaphors, heuristic symbols and analogies. Tacit knowledge is also viewed as "*context-specific and relational, that is socially constructed as it is generated dynamically at the level of the social interaction system*" (Broekstra, 1998:168).

According to Broekstra, it is "*quite useful to think in term of a tacit organisation (...) and the explicit organisation (...) as two distinct, but interrelated 'organisations' (..) considering that commonly managerial control, if not the whole of the managerial praxis, is directed at the interactively open explicit organisation, which is subject to the imperative of economic rationality. By contrast, the tacit organisation represents the organisationally closed, deep natural system, the autonomous generative source of organisational life*" (*ibid.*:169).

As a consequence of this distinction between tacit and explicit organisations, Broekstra concludes that "*transformational or second order change should be directed primarily at the tacit organisation to elicit, through a symmetry-breaking,* ***deep change*** *of the whole system, rather than just a part of it*" (*ibid.*:170). This perspective is congruent with Argyris & Schön's (1978) theory of organisational learning. In this respect Argyris (1992) stresses that "*the single-loop refers to learning or adjustment that follows the recognition of an error*". … *Single-loop learning does not solve the more basic problem of why these problems existed in the first place*". Double-loop learning calls for a higher level of learning, questioning why errors happened and problems occurred (Argyris, 1992:18).

Argyris & Schön distinguished between theories created, "*to understand and predict*" and *"theories created to help people make events come about*". The latter, they have called "*theories of action*" (Argyris & Schön, 1978:5). Furthermore, they proposed to distinguish between *espoused* theory of action and *theory-in-use*. As they put it: "*organisations have theories of action which inform their actions, espoused theories which they announce to the world and theories-in-use which may be inferred from their directly observable behaviour*" (*ibid.*:11). According to Argyris & Schön, "w*hatever the reason for tacitness, the largely tacit* ***theory-in-use*** *accounts for organisational identity and continuity*"(*ibid.*:15). Finally, they conclude that: "***organisational learning might be understood as the testing and restructuring of organisational theories of action***" (*ibid.*:11, emphases added).

Whereas these above reviewed theoretical developments on organisational management and learning have the potential to influence current understanding of institutional change as an innovation that may lead to a new theory of action, they are related more with the private company's experiences and practices. As I have stated elsewhere, *"the uncritical and decontextualised application of the private models of enterprise management in public and not-for-profit RR&D organisations induces distortions and mutations that invalidate their identity and mandate*" (Santamaria, 2002:2).

3.4 Main theoretical perspectives on institutional innovation in public and not-for-profit organisations

Regarding institutional innovation in public and not-for-profit organisations, the most influential theoretical perspectives are rooted in economics (more recently, also ecological economics), sociology and anthropology. Institutionalism (economic and behavioural approaches) and a cultural approach, among others, provide relevant concepts, methods and theoretical perspectives to the study of institutional innovation of RR&D organisations.

3.4.1 Institutionalism

From different perspectives (economic, political, social), 'old' (e.g., Veblen & Ayres, Commons, Samuels & Mitchell) and 'new' (e.g., DiMaggio & Powell, North, Rutherford, Maki, Thompson, Drobak & Nye, Young, Ostrom) institutionalists try to understand how institutions influence the *patterning of social life,* which emerge from interactive human behaviour. Most contributors to this perspective treat institutions as *sets of rules*, decision-making *arrangements*, and *mental schemes* that mould individual and collective practice. Additionally, they make clear distinction between institutions and organisations treated as physical entities with offices, personnel, equipment, budgets, and so forth. Therefore, individuals and organisations are seen as actors who typically emerge as players whose activities are guided by the dominant *rules of the game* of the organisational configurations in which they participate.

While some institutionalists (North, 1990; DiMaggio & Powell, 1991; Rutherford, 1994) emphasised the influence of formal or espoused rules of the game (contracts, constitutions, treaties, or other constitutive documents), others (Ostrom, 1990; Young, 2000; Scott, 1995) are more interested in the rules in use, which include common discourse, informal understanding and routinised activities. The former group direct attention to matters of enforcement, coercive mechanisms and compliance or conformance as sources of behaviour. The latter institutionalists focus on a broader range of "*behavioural patterns arising in conjunction with the operation of social practices*" (Young, 2000:6).

Institutionalist researchers are concerned with the study of:

- *the processes through which institutions form or become established;*
- *the effectiveness of institutions or the extent to which they impact the course of collective outcomes in various social settings; and*
- *the dynamics of institutions or the forces determining both the robustness of social practices and ways in which they change over time* (*ibid.*:2).

Those institutionalists embracing a rational-choice perspective, focus on actors, individuals, organisations, governments, public organisations, non-governmental organisations and so on, while those who embrace a social-realist perspective, focus on factors that influence and guide

the actions of those actors. Some analysts such as Ostrom have attempted to bridge the gap between the two perspectives and to integrate them into the study of institutions and their impacts on human behaviour. Ostrom and her colleagues have combined institutional approaches with game theory models to provide a framework of institutional choice for the analysis of local institutions managing common-pool resources (Ostrom, 1990, 1991, 1992).

An increasing interest in studying of 'global institutions' can be observed among new institutionalists. Political scientists and scholars in international studies investigate institutions such as emerging environmental regimes on climate change, ozone depletion, marine resources, etc. For these scientists, regimes are social institutions composed of agreed-upon principles, norms, rules and decision-making procedures that govern the interactions of actors in specific issue areas. They are the rules of the game that determine the character of recognised social practices. (Young, 1994; Young & Osherenko, 1993; Krasner, 1983; Rittberger, 1993).

The **economic approach to institutions** (e.g., North, Thomas, Williamson, Ruttan, Goldsmith, Schultz) is mainly concerned with how the institutional environment, comprised of markets, exchange systems and systems of property rights, affects organisations mostly through rules and regulations that affect transaction costs. As such, institutions are seen as arrangements created by actors who have a collective interest and who want to avoid joint losses or reaping joint gains. As North put it, "*institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction. In consequence they structure incentives in human exchange, whether political, social, or economic. Institutional change shapes the way societies evolve through time and hence is the key to understanding historical change*" (North, 1990:3).

Douglas North and Robert Thomas (1973) attempted to explain the economic growth of Western Europe between 900 and 1700 primarily in terms of innovations in institutional rules that governed property rights. Theodore Schultz (1964), identified the rising economic value of labour during the process of economic development as a primary source of institutional innovation.

Nevertheless, institutional economics has recognised that, although the rules may be the same, the enforcement mechanism, the way enforcement occurs, the norms of behaviour, and the subjective models of the actors will be context-specific. Hence, both the real incentive structures and the perceived consequences of policies will differ as well. Thus, "*a common imposition of a set of rules will lead to widely divergent outcomes in societies with different institutional arrangements*" (North, 1990:101).

The self-contained context (i.e. endogenous decision making) and the external context, especially the market, are seen as the major sources of constraints on individual choice. The perceptions of actors play a more central role in institutions than in technological change because ideological belief influences the subjective construction of the models that determine choices (North, 1990:103).

Analysing institutional change in agriculture, Ruttan (1999), has pointed out what he considers its most important "*powerful driving forces in inducing both technical and institutional change*:

1. *The closing of the land frontier has been a major driving force inducing both technical and institutional change in agriculture in both traditional and modern societies.*

2. *Increases in the price of labor relative to capital has been a pervasive force of technical and institutional change in both industry and agriculture for a least the last two centuries.*
3. *The rising value of open access and common property environmental resources has, during the last quarter of the 20th century, become an important driving force in inducing institutional change* (Ruttan, 1999:30).

The **sociological approach** (e.g., Berger, Luckmann, Scott, Meyer**,** Rowan, Dimaggio and Powell) is summarised by Scott, who expands the definition of institutions. As Scott put it: *"institutions consist of cognitive, normative, and regulative structures and activities that provide stability and meaning to social behaviour. Institutions are transported by various carriers - cultures, structures, and routines - and they operate at multiple levels of jurisdiction"* (Scott, 1995:33).

Scott suggested a conceptual framework to overcome the 'controversies' regarding the explanation of institutional forms. First, he proposed a social constructionist contextual rationality in which interests are endogenous and instrumental technologies and criteria of efficiency are social products. According to Scott, the rational choice models apply under a special limited condition: *"those that constitute individual social actors as possessing private interests and the capacity to take action to protect them" (ibid.*:140).

Second, regarding bottom-up and top-down explanations of the construction of new institutions and the transmission or diffusion of existing institutions, he proposed a two-directional layered model (see Figure 3.1).

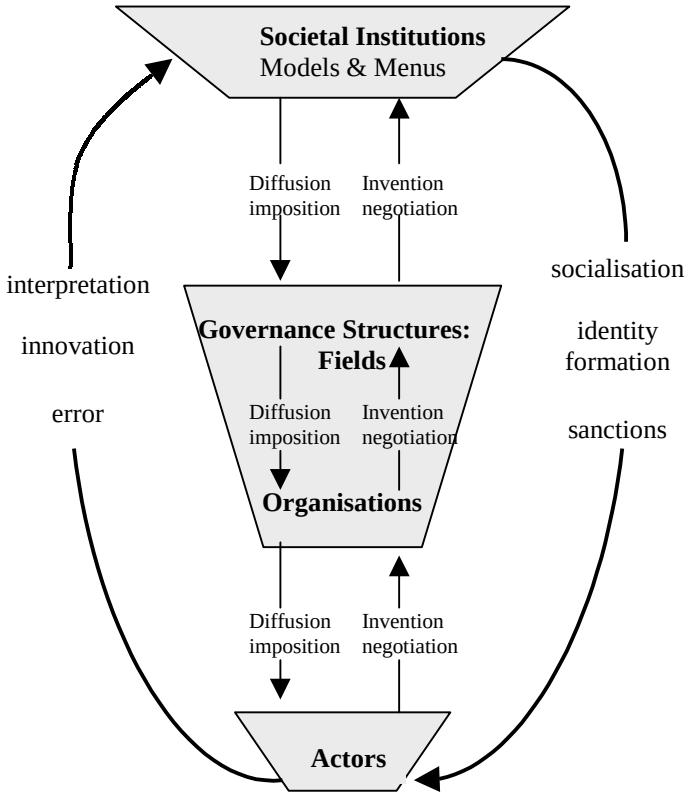


Figure 3.1 Top-down and bottom-up processes in institutional creation and diffusion (Scott, 1995)

In Scott's model, societal institutions provide a context in which more specific institutional fields and forms exist, shaping them both as agent and as environment. Organisational fields operate at intermediate levels, providing institutional structures within which specific organisations operate. And organisations provide institutional contexts for particular actors. According to this framework, models - beliefs, norms, menus, and scripts - "*flow 'down' through the various levels, carried by socialisation, social construction, and sanctioning powers. These models are carried and reproduced, but also modified and reconstructed, by the interpretations and interventions of subordinate actors: individual, organisations and fields*" (*ibid.*:141).

According to Scott, organisation models are, under some conditions, generated by processes of interaction and negotiation among institutional agents and organisational participants. In sociology, the dominant approach on institutions has emphasised the cognitive dimension over the normative. Still, some sociologists have embraced a rational-choice perspective to social institutions (e.g., Coleman, Hetcher) and their analysis is quite similar to the institutional economic approach.

From the above-cited accounts of Nonaka & Takeuchi, Broekstra, Argyris & Schön, and Scott, it seems to be clear that organisational change has to do with changes in tacit knowledge both at individual and organisational levels. What is not yet clear is the relationship between individual agency and organisational praxis, informed by theories of action.

Anthony Giddens (1984) in an attempt to explain the interaction between social structure and human agency developed the *structuration theory.* By means of institutional analysis, Giddens distinguished two components of social structure: the rules (interpretative schemes, and moral rules), and the resources (material and authoritative). He also used the concepts, "*structural properties*" and "*structural principles*". Structural principles are the most deeply embedded institutions of a given social structure. According to Giddens, the interaction between social structure and human agency is cyclical, therefore the former is at the same time the precondition and the unintended outcome of people's agency. The way social structures enable people to interact and are reproduced by people's interaction is what Giddens called the "*duality of structure*"[17]. Another key element in Giddens' structuration theory is the concept of "*double hermeneutic*", or the interpretation of interpretative human conduct, based on implicit assumptions. Whether people think the sun turns around the earth or vice versa does not affect the behaviour of these celestial bodies, says Giddens. But what people think of other people can strongly affect the behaviour of the latter (Giddens, 1984).

Another integrating contribution to "*uncover the structural conditions of people's action and to help them to transcend these conditions*" is the "*theory of communicative action*" formulated by Jürgen Habermas (1984 and 1987). For Habermas, the social system (institutions) has to do with the ways "*social structures"* constrain people's action, which includes issues of power and class oppression. On the other hand, the "*life world*" (human conduct in Giddens' theory), raises issues of meaning and communication. Habermas distinguishes between the empirical (analytical knowledge that is concerned with causal explanation associated with the external world) and the hermeneutic (the understanding of meaning associated with the inner world), and is concerned with language and communication. According with this distinction between world and types of knowledge, Habermas also distinguishes between different types of action: *instrumental,* associated with the material world; *strategic,* associated to the social world; and *communicative*,

[17] This notion is quite similar to the "*structural coupling*" of the cognitive agent with the domain of existence, suggested by Maturana and Varela (1992).

actions associated with the inner world. Each type of human action is associate with a different sense of 'rightness' according to Habermas: right action refers to factual truth (material world), to moral rightness (social world) and to sincerity (inner world) (Habermas, 1984).

Recently, Fritjof Capra (2002) made an additional contribution to this issue, extending the "*systemic understanding of life*" to the social world. He integrates four perspectives: *form, matter, process and meaning,* in a social network configuration. As Capra put it: "*social network are first and foremost networks of communication involving symbolic language, cultural constraints, relationships of power and so on*" (Capra, 2002:71). These network of communication are self-generating (*autopoietic*). Through *emergence* and communication, the entire network generates itself, producing a common context of meaning, shared knowledge, rules of conduct, a boundary and a collective identity for its members (*ibid.*:94). Capra distinguishes between the "*formal structure*" and the "*informal structure*" within organisations. The informal structure is organised in several "*communities of practice*". Communities of practice are the social networks of communications within organisations, and therefore, *"the most effective way to enhance an organisation's learning potential is to support and strengthen communities of practice*" (*ibid.*:101).

3.4.2 Cultural approach to institutions

The cultural approach to organisation (Douglas 1982, 1987 and 1992; Thompson *et al*., 1990, and Hood, 2000) aims to "*capture the diversity of human preferences about 'ways of life' and to relate those preferences to different possible styles of organisation*" (Hood, 2000:7). The cultural analysis offers a classification scheme of cultural worldviews. These include views of nature and human nature, risk attitudes, time horizons, perceived interests, systems of allocating blame, and ways of matching needs and resources, everything attuned to the legitimising of the preferred social organisation. It assumes that culture and organisation interact as a single system, the cultural values responding to the current organisation, and, likewise for the organisations to be sustained by the appropriate values.

The possible ways of structuring and justifying human interaction are mapped on two dimensions: 'group' - the extent to which individual choice is constrained by group choice, and 'grid' - the degree to which our lives are circumscribed by conventions and rules (see Table 3.1). The four cultural worldviews are usually labelled: hierarchy (high group, high grid), egalitarianism (high group, low grid), individualism (low group, low grid), and fatalism (low group, high grid).

Each of the four cultural worldviews is articulated in opposition to the others. As Hood put it, "*cultural dynamics work by mutual antagonism among opposites seeking to blame adherents of alternative ways of life for the social ills they are held to create*" (Hood, 2000:11). According to Douglas, "*the positions are not absolute: there is no absolute hierarchy - organisations are merely more or less hierarchical*" (Douglas, 1992:177). Moreover, whenever we speak of the culture of a community or organisation, we should acknowledge that if one worldview is dominant, it coexists with three others.

For particular purposes, two cultural worldviews may form a coalition to achieve a particular purpose desired by both. When this happens for a sustained period of time, then the resulting dominant discourse is sometimes called a "*cultural regime"* (Thompson *et al*., 1990). Each cultural regime comprises a particular way of defining and solving social problems, supported by alternative ways of generating information, learning, as well as of motivating people.

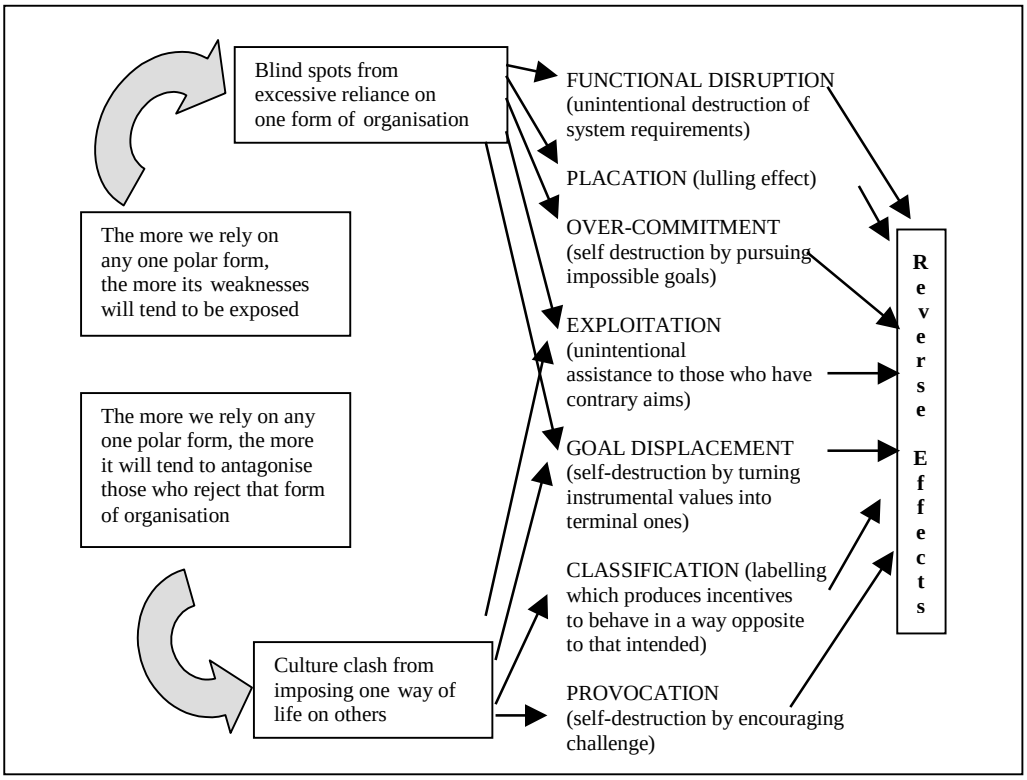
Table 3.1 Four cultural worldviews on organisations

Grid	Group	
	Low	High
High	***Fatalism*** Low co-operation widespread distrust and apathy reign.	***Hierarchy*** Rule-oriented, cohesive (bureaucracies)
Low	***Individualism*** Preference for bargaining and negotiation of every transaction. (Market)	***Egalitarianism*** Clear rules of the game, strong principles and values and highly participatory. (Sects and communes)

Source: Adapted from Douglas, 1982; Thompson *et al*., 1990; and Hood, 2000.

The notion of *cultural regime* is quite similar to the concept of *institution* as defined by institutionalists. Nevertheless, while some 'culturalists' have considered the co-existence, at least temporarily, of two polar worldviews to create a viable form of institutions, others have stressed their distinctiveness. For example, Douglas (1992) considers three types of normative order, "*each so distinctive that no speaker in one type can appeal to the justifying principles, which uphold another type without obvious and grave inconsistency*". These are:

- *the first bases its whole system of relations on bonding insiders together against outsiders;*
- *the second upholds the trust necessary for exchange between individuals; and*
- *the third legitimises the up-down hierarchical bonding of individuals* (Douglas, 1992:137).



Source: Hood, 2000.

Figure 3.2 Cultural worldviews and reverse effects: two possible mechanism

Thus, this idea of *internal consistency* of a 'normative order', 'knowledge-based action', a 'cognitive system', or a 'set of rules of the game' is what has been called *coherence* (e.g., Kolb, 1984; Maturana and Varela, 1992; Bawden, 2001; Roling, 2002; De Souza Silva *et al*., 2001). The search for *coherence* is one of the drivers of institutional innovation, but can also lead to a 'blinding insight' or 'reverse effect' (see Figure 3.2).

According to Hood (2000), the negative reverse effects resulting from the adoption of a framework drawn from one of the four cultural worldviews can be expected to be more severe, the more weight is put on any one of them, for two main reasons:

- "*The more reliance is placed on any one polar approach to public management the more serious its 'blind spots' are likely to become.*
- *Each polar approach as it comes into general currency will tend to antagonise those who prefer alternative ways of organising, creating the conditions for reverse effect*" (Hood, 2000:217).

3.5 From vulnerability to organisational sustainability of RR&D organisations

3.5.1 Organisational development

After World War II, international co-operation conceptualised organisational capacity in a way associated to only two dimensions: construction of infrastructure and professional formation, which was congruent with the general policy of reconstruction of the post-war period and the associated political strategy of the 'cold war'. Development agencies, notably USAID, set out in the 1960s *institution-building* programs focused more on the organisational strengthening of public sector entities. For RR&D organisations, that meant the construction of host buildings, experimental stations, laboratories and training of their personnel mainly in the different disciplines of agrarian science.

In the late 1970s, a new wave of support programs was included in development assistance[18] - *institutional development*. Rooted in institutional economics that focuses more on the 'rules of the game' at the inter-organisational level, *institutional development* stresses the change of organisational environment that affects organisational performance. It looks at individuals' choices and how they are affected by the structure of incentives, as a remedy to the perverse effects (rent-seeking and free-riding) of capacity-building efforts; the creation of a system of rewards and penalties is then proposed (Goldsmith, 1991).

Another theoretical framework for strengthening RR&D was developed by Brinkernhoff and Goldsmith (1990 and 1992) at the University of Maryland - the "*institutional sustainability"* approach. Drawn on institutional economics and strategic management, it has two guiding assumptions:

- "*The survival of an organisation over the long-run is affected by its internal capabilities and its external environment.*
- *To remain viable in a changing world, an organisation must develop and stick to a strategy or game plan with a strong fit among its own internal strengths and weaknesses and external threats and opportunities*" (Brinkerhoff and Goldsmith, 1992:372)

[18] In 1978, 72 percent of World Bank projects had institutional development components; by 1989, the proportion was over 90 percent (Paul, 1990 quoted by Goldsmith, 1991:8)

According to Brinkerhoff and Goldsmith (1992), sustainable organisations (role-oriented institutions) are organisations whose strategies enable them to make the best of their internal capabilities and to capitalise on their external context. Furthermore, this approach was incorporated in international co-operation as *capacity-building* or *capacity development* projects and programs.

From the instrumental perspective, organisational capacity is defined as *"the ability to carry out stated objectives*" (Goodman, 1998, quoted by Brown *et al.,* 2001:12). Subsequently, many donors and multilateral agencies consider capacity-building as: *"any activities which increase our partner's abilities to carry out or assist others to carry out efforts successfully to improve the lives of the poor"* (INTRA, 1998, quoted by Brown *et al.,* 2001:12). In practice however, such capacity-building activities are often limited to promoting project-related activities.

On the other hand, Horton (2001) has proposed that: "*organisational capacity is the potential for engaging resources and skills in optimum combinations in order to perform relevant activities and tasks in line with the organisation's strategy*" and suggested the term "*organisational capacity development*", which he refers to as: *"the systematic process of planned organisational change that is intended to enhance the efficiency, effectiveness, and sustainability with which the organisation pursues its strategy, accomplishes its mission, achieves its goals, and delivers value to its stakeholders"* (Horton*,* 2001:8).

Since September 2000, under the leadership of ISNAR and co-ordinated by Douglas Horton, the ISNAR Evaluating Capacity Development project (ISNAR ECD project) established a network of practitioners with representatives from international, national and local R&D organisations working on organisational capacity development. Working on the evaluation of capacity development in RR&D organisations, actors of five case studies and specialists from ISNAR drew important lessons that stress the multidimensional character of this process. The participants in the Midterm Review and Synthesis Workshop of the ISNAR ECD project identified the following lessons:

- *Capacity development is not just a technical activity.*
- *Capacity development should not be viewed as a one-off, isolated undertaking.*
- *Capacity development implies much more than the delivery or acquisition of human and other resources.*
- *Capacity-development efforts should be driven by the needs and demands of the recipient organisation.*
- *Prior to launching a capacity-development effort, an organisational diagnosis should be carried out.*
- *Capacity-development efforts should be designed and implemented so as to enable organisations, groups, and individuals to achieve their own objectives.*
- *Capacity-development efforts require complementary mind-sets on the part of the organisation and its external partners.*
- *Capacity-development efforts should be guided by common objectives, shared concepts, and a coherent theory of action that is agreed on by the key group involved in the process.*
- *A capacity-development effort should promote self-reliance and help the organisation balance autonomy with partnership and collaboration* (*ibid*.:3)

While these dimensions are critical for many RR&D organisations, in a change of epoch, intellectual and cultural capabilities assume an importance absolutely unsuspected for all

organisations, within both developed and developing countries. Indeed, the global transformations that are creating a change of epoch are the same for all, but their meaning and implications are not. No two countries or organisations are identical, which means that their perception and interpretations of external changes as well as their responses to them will differ.

3.5.2 Organisational sustainability[19]

Development organisations do not exist in a social vacuum, are not created to satisfy themselves, nor must they do simply what they want. In order to contribute to the process of its own development, society creates, finances, changes and possibly extinguishes organisations. Only then can the organisational sustainability be understood in the context of the society that has created and finances it and in which the organisation (by means of its multiple functions) is able to contribute. Therefore, the organisational sustainability is (re)constructed historically by means of a 'social contract' with the society to which it belongs.

Being context-dependent, organisational sustainability is an on-going negotiation process between an organisation and its relevant external context. Sustainability is an emergent property of a Soft System (Röling & Wagemakers, 1998). The higher the coincidence between the goods and services generated by the organisation and the needs, realities and aspirations of its various stakeholders, the higher the degree of their satisfaction and the higher the possibility for transforming their recognition into social, political, institutional and financial support. From this perspective, no organisation is sustainable forever; as its external context changes so does the basis for its sustainability. Thus, sustainable organisations are changing organisations that take into consideration the changes taking place in their relevant external context, through the direct participation of key representatives of its stakeholders (Mato *et al*., 2001).

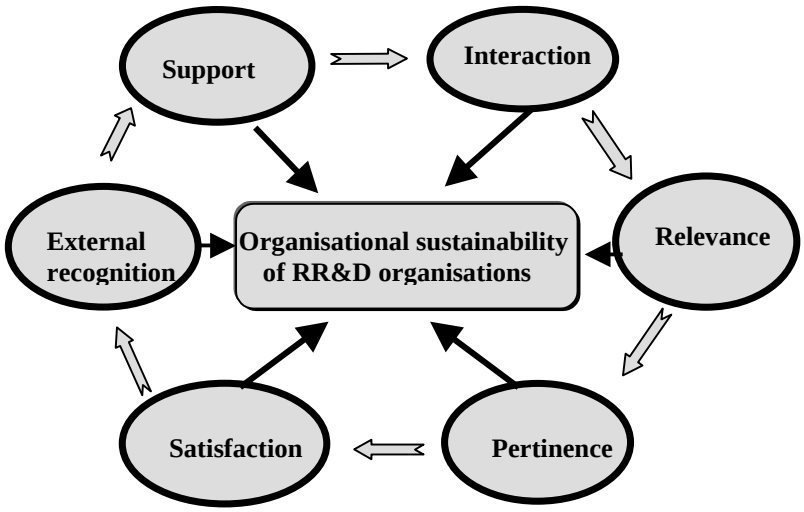


Figure 3.3 Critical circle or chain of events explaining institutional sustainability (adapted from Mato *et al*., 2001)

In this context, the understanding of what organisational sustainability is does not have to be reduced to a simple definition. More pertinent than defining organisational sustainability is to conceptualise it in contextualised form. Figure 3.3 contributes contextual elements for the conceptualisation of organisational sustainability in the form of a 'chain of hypotheses' of the critical circle of organisational sustainability.

[19] This section draws on Mato *et al*., 2001.

If RR&D organisations are to start a journey from vulnerability to sustainability, they will have to go through a change process in which institutional innovation precedes technological innovation. This means that they need to change their institutional frameworks for thinking, deciding, and acting first, before they start innovating their products and services. They need to innovate themselves, taking as reference the consequences of the chain of events explaining organisational sustainability (see Figure 3.3).

Organisational sustainability is expressed by the consistency, legitimacy, credibility and pertinence of an organisation through time, and not by its simple physical existence or material survival. Organisational sustainability of development organisations will depend on the degree of:

- **interaction** between the RR&D organisation and the relevant social, economic, political, and institutional actors from its relevant external context;
- **relevance** between the organisation's function and mission, and those actors' present and future problems and challenges;
- **pertinence** of the concrete contributions delivered by the organisation;
- **satisfaction** by those social, economic, political, and institutional actors;
- social **recognition**, external legitimacy, and institutional credibility built by the organisation; and
- social, political, institutional, and financial **support** shared by those external actors;

Therefore, when we are talking of organisational vulnerability, we mean the loss of *coherence and correspondence* of the rules of the game of the organisations in front of the society in general, and the actors of their relevant context in particular. This implies the drastic loss of credibility, legitimacy, recognition and, therefore, of political and financial support. Thus, to deliver goods and services in tune with the problems and challenges associated with the emerging epoch, RR&D organisations need first to coherently reconfigure their rules of the game in correspondence with the needs, aspirations and demands of their relevant context.

Especially for public RR&D organisations, the question of how to manage institutional innovation and build organisational sustainability has vital importance. Faced with reconstruction and privatisation processes, and oriented by the instrumental view on change, most organisations are vulnerable. In order to reverse their vulnerability, most organisations are struggling to build a new basis for their sustainability. However, to build their sustainability, these organisations need to innovate and, therefore, they have to change.

3.5.3 Competing worldviews on organisational change

One of the assumptions of this research is that the value frameworks (but not exclusively) determine the image of the organisation and therefore influences the view of organisational and institutional change. As Ryan (1972) has pointed out, "*it is only in the context of shared paradigm that a person's behaviour can be made intelligible, not just to the spectator but even to the agent himself…. The value, which an actor places on his actions, is only intelligible or defensible within the framework provided by the appropriate social paradigm*…" (Ryan, 1972:93).

As was stated above, four social worldviews are competing to prevail in the emerging epoch: Mechanistic, economic, evolutionary and holistic worldviews (De Souza Silva *et al*., 2001; Mato *et al*., 2001)

For people who embrace the **mechanistic worldview** the world is like a machine, and human beings are "*human resources*", automatons able to carry out just routine tasks. Agriculture is a machine to produce food and fibre, and rural research and development organisations are machines at the service of efficiency.

As Scott (1987) has argued, this worldview represents the rational, objectivist alternative definition of an organisation: "*organisations are collectivities oriented to the pursuit of relatively specific goals and exhibiting relatively highly formalised social structures*" (Scott, 1987:22).

According to Morgan (1986), the following are the limitations and strengths of the mechanistic image of organisation[20].

Limitations:

1. *It can create organisational forms that have great difficulty in adapting to changing circumstances.*
2. *It can result in mindless and unquestioning bureaucracy.*
3. *It can have unanticipated and undesirable consequences as the interests of those working in the organisation take precedence over the goals the organisation was designed to achieve.*
4. *It can have dehumanising effects upon employees, especially those at the lower level of the organisational hierarchy* (Morgan, 1986:35).

Strengths:

1. *It can work when there is a straightforward task to perform.*
2. *It can work when the environment is stable enough to ensure that the products produced will be appropriate ones.*
3. *It can work when one wishes to produce exactly the same product time and again.*
4. *It can work when precision is at a premium.*
5. *It can work when the human "machine" parts are compliant and behave as they have been designed to do* (*ibid.*:34).

Influenced by the mechanistic vision of the organisation, "*gurus*" of organisational management proposed among others: scientific management, administration by objectives and social re-engineering management models of institutional change, in the search for effectiveness and productivity. Here, when they do not forget the human factor (as M. Hammer, the father of re-engineering publicly recognised[21]), the people are considered to be 'resources', on a par with the financial and physical ones. Organisational change is limited to a diminution of size, reduction of personnel and optimisation of processes.

From the **economic worldview**, the world is a market without societies, populated by providers, producers, processors, sellers, buyers, consumers, competitors, and investors; human beings are "*human or intellectual capital*". Agriculture is a provider of raw materials and a space for capital accumulation and the satisfaction of ever expanding human preferences. RR&D organisations

[20] Gareth Morgan (1986) in his book Images of Organisations identified different metaphors or images of organisation that influence the way people see organisation: machine, organism, politic system, brain, culture and psychic prison among others.

[21] About Hamers's public declaration see White, 1996.

are commercial providers of information and technology at the service of capital accumulation and economic growth.

Within the framework of neo-liberal globalisation, the economic worldview of organisations considers them as "*agents of the market*" in search of competitiveness and efficiency. The complex social relations are reduced to competition between unequal agents and to the creation of "*human, social or intellectual capital*", for which strategic planning and "*total quality*" are the management models par excellence. The aims of development of organisations sharing this philosophy is to continually seek improvements in economic productivity, expressed as some measure of its profitability, and to minimise the impact of negative externalities. Its outcomes are strongly influenced by the external factors, especially by the market.

For the **evolutionist worldview**, the organisation is a live organism (or ecosystem), which is born, grows, and will die when it is unable to "*renew"* itself. From this perspective, "*organisations are collectivities whose participants share a common interest in the survival of the system and who engage in collective activities, informally structured, to secure this end*." (Scott, 1987:23). According to Hurst (1995), for example, human organisations cycle around similar phases as natural systems, between emergent and constrained action. The ecocycle model of organisational change proposed by Hurst (see Figure 3.4) is based on the 'lazy eight' originally suggested by Holling (e.g., 1995) to describe the cyclical dynamics of ecosystems.

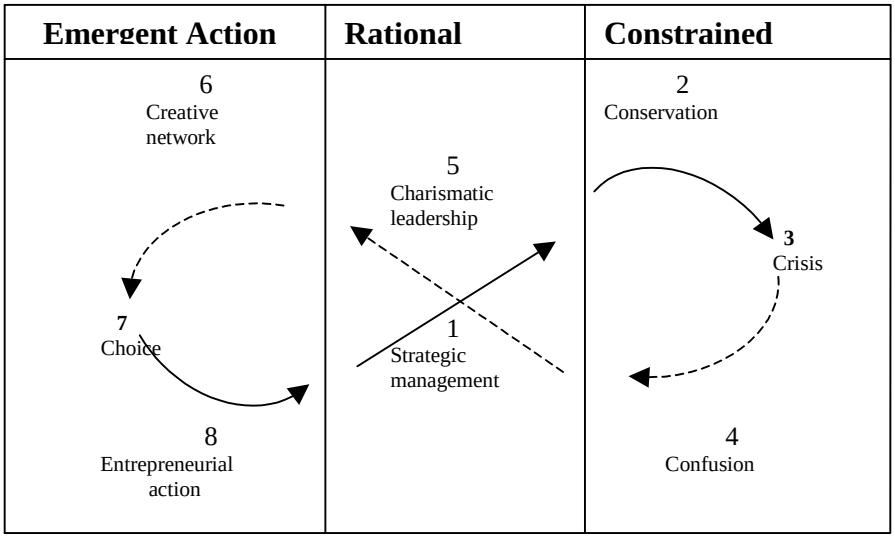


Figure 3.4 Organisational change described through an ecocycle' model of crisis and renewal (Hurst, 1995)

The 'performance loop' of the model, shown as a solid line, is the '*conventional life cycle*'. This according to Hurst, is where strategic management is found. The '*learning loop'*, shown as a dotted line, represents a "*a less familiar, renewal cycle of 'death' and reconception*'. This is the realm of charismatic leadership of organisations (generally its managers), who in addition to being visionaries, know how "*to interpret the originating signals of change from the environment*" (Hurst, 1995:104).

Therefore, under the evolutionist worldview, organisational change is perceived as a process of adaptation and survival of the most adapted, under the influence of the environment.

Under the **holistic worldview**, one can look at humans as intentional and learning cognitive agents, and at human organisations as collective or inter-subjective cognitive agents (Röling, 2000). The world is perceived as a complex, open, dynamic and eventually contradictory entity constituted by diverse and interdependent dimensions with multiple and interconnected functions. The institutional innovation is a complex and interactive process of construction and collective appropriation, where human talents of the organisation negotiate both the aims and the means to create a new institutional coherence. A development organisation is perceived as a facilitator of change and development, integrating an institutional development matrix, with the participation of professional talents, who are creative citizens able to imagine and propose beyond their previous knowledge and experience (De Souza Silva *et al*., 2001; Mato *et al*., 2001).

In the next chapter, some outcomes of this review are highlighted. It gives a preamble to the formulation of research questions and the definition of the general methodology of this research.

Chapter 4. Research Methodology

4.1 Overview

In order to be internally consistent, the researcher must necessarily assure the coherence between his methodological strategy and his previous answers to the basic philosophical (ontological and epistemological) questions. Thus, the definition of a research methodology cannot simply be reduced to a question of methods and techniques, because these are ethically and politically associated to the implications of the commitments derived from the embraced ontological and epistemological perspectives. Indeed, as methodology is concerned with the *logic* and *design* of inquiry, the issue of how one enters into a research setting influences the development of the research process.

This chapter presents the methodological strategy of research - a chosen configuration of macro steps involving research activities, factors and actors to accomplish the research objectives. I will begin by presenting the methodological implications of the outcomes from the previous three chapters. This provides a foundation for the formulation of the general research questions and for describing and justifying the chosen methodological perspectives with respect to the rigour of the research process and the interpretation of data for learning outcomes. In addition, the analytical framework for identification of theories of action and the selected case studies are presented. The chapter concludes with a description of the general research techniques used for observing, interpreting and collecting data during the research process.

4.2 Outcomes of previous chapters, with implications for research methodology

To generate socially committed knowledge and to contribute to the development of a new theory of action for institutional innovation in the context of its application and implications implies ethical and political decisions about theoretical and methodological research perspectives.

All research is based on some underlying assumptions[22] about what constitutes 'valid' research and which research methods are appropriate. In order to conduct qualitative research, it is therefore important to know what these (sometimes hidden) assumptions are. For my purposes, the most pertinent philosophical assumptions are those, which relate to the epistemology that underlyes the research. On the other hand, the judgements about the rigour of research should be based on criteria which make sense only for the methodology for which they were developed.

In the next sections, the outcomes of previous chapters that have the potential to influence the research methodology are presented.

[22] According to Brookfield (1995), there are four central processes to be critically reflective: assumption analysis, contextual awareness, imaginative speculation and reflective scepticism. Assumption analysis describes the activity adults engage in to bring to awareness beliefs, values, cultural practices, and social structures regulating behaviour and to assess their impact on daily activities. Assumptions structure our way of seeing reality, govern our behaviour, and describe how relationships should be ordered. Assumption analysis as a first step in the critical reflection process makes explicit our taken-for-granted notions of reality (Brookfield 1995).

4.2.1 Outcomes from the (de)construction of my epistemic development

Critical reflection on the information presented in the introductory chapter allowed me to draw the following outcomes:

- **Learning style**: While my learning experiences analysed in the introductory chapter corresponded to learning through reflection, the learning process presented here is based on 'scientific' inquiry, which implies a different way of learning. As Bawden puts it "*experiential human inquiry is a way of making sense of the world about us in order to take some informed action in it*" (Bawden, 2001:10). A cycle of inquiry will require going through all four of Kolb's dimension (see Figure 1.1). Starting with experience, then reflecting on it, analysing it, creating concepts, theory or explanations based on the understanding achieved, and confront these in turn with practice in a specific context where the knowledge is appropriated and re-configured through new experiences.

- **Double role as researcher and facilitator**: Alrøe and Kristensen (2002) have proposed a self-reflective cycle of learning in 'systemic research' as a "*cyclic cognitive process including the representation of oneself as another. This model is in analogy with human self-conscious learning based on the ability to take a mental step out and look upon oneself and one's action from outside, and use this outside view in later action*" (Alrøe and Kristensen, 2002:8). In Figure 4.1, this proposal is combined with Bawden's notion that a particular worldview which we embrace at any given time will "*dictate the nature of our actions*". Thus, it is necessary to distinguish clearly my role during this research as actor in researched case studies, from my role as 'observer/researcher' (Bawden, 2001; Alrøe and Kristensen, 2002).

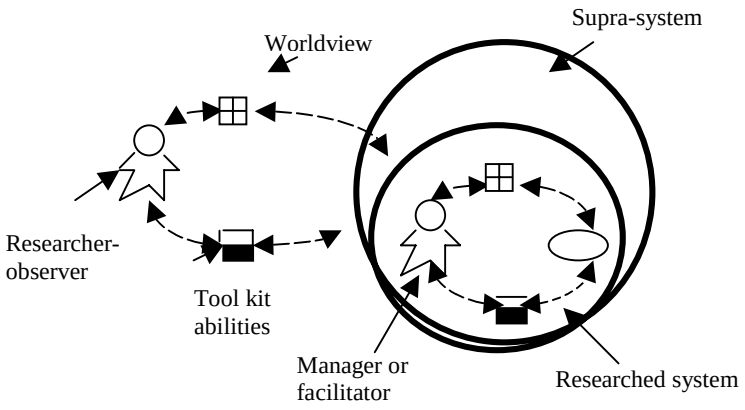


Figure 4.1 Self-reflective cycle of learning in systemic research (adapted from Bawden, 2001 and Alrøe and Kristensen, 2002)

In particular, Bawden (2001) has used the model in Figure 4.1 to show "*a researcher* (who embraced an eco-centric worldview) *researching the relationships between a system 'manager' (*or farmer, or facilitator of change) *(i) with the sub-systems within the system, (ii) with other resources available within the system, and (iii) between the* (researched) *system itself and the environmental supra-system in which it is embedded*" (Bawden, 2001:10). This impersonal, 'objective' approach is understandable where researchers seek to observe and report understanding or change of 'the system' that exists outside of them.

In my case, this is not the situation. First, because according to my core philosophical assumptions, a system does not exist until constituent actors construct it. Second, because of my double role as both researcher-observer and facilitator of institutional change. Finally, in the New Paradigm case study in particular we developed concepts, approaches and other insights that we tried out in concrete situations. During and after the application phase, we discussed the experience, drew lessons and if necessary reconfigured the conceptual and methodological 'tools'. This means that the roles of researcher and facilitator became intertwined in a kind of participatory action-reflection within a "*reflexively complex social system"*[23] (Funtowicz *et al., 1999)*.

- **Paradigmatic assumptions**: My epistemic development from instrumental techno-centric to holo-centric worldview and Soft System thinking (see Figure 4.2) as it was explained through the reflection on my career phases, provided me with "*paradigmatic assumptions*" for my doctoral studies. Kuhn (1970) defined scientific paradigms as: "*universally recognised scientific achievements that for a time provide model problems and solutions to a community of practitioners*" (Kuhn, 1970:viii). Additionally, Guba and Lincoln defined a scientific paradigm as: "*the basic belief system or worldview that guides the investigator, not only in choice of method but in ontologically and epistemologically fundamental ways"* (Guba & Lincoln, 1994:105).

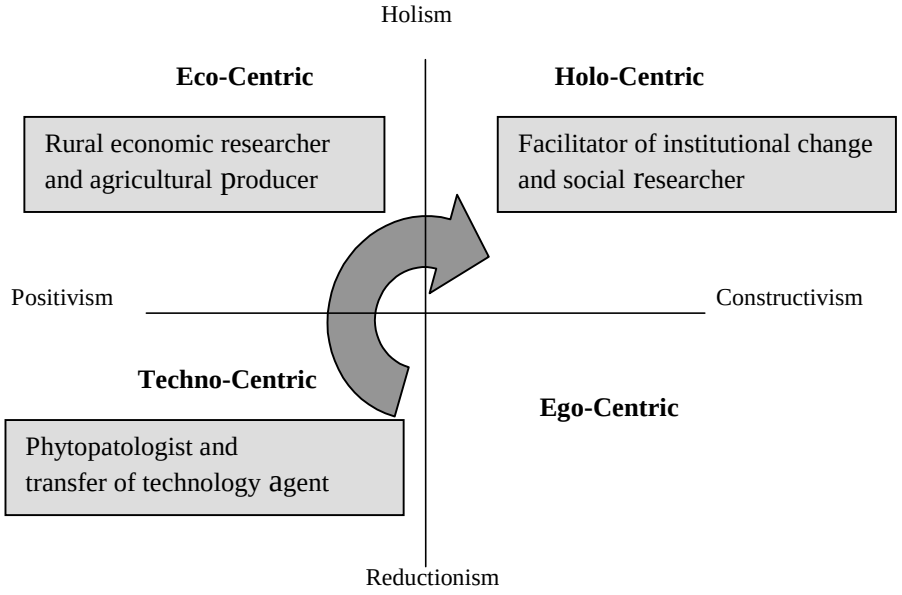


Figure 4.2 The paradigm shift during my career phases

If, as stated above, the definition of the methodological strategy of research has to be internally consistent (coherent) with the embraced ontological and epistemological perspectives, then for this research, the methodology has to be consistent with the holistic ontology and constructivist epistemology that I subscribe to.

[23] Funtowicz and Ravetz (1994) have proposed what they call post-normal science, as a *"methodology for managing complex science-related issues. This (approach) focuses on aspects of problem-solving that tend to be neglected in traditional accounts of scientific practice: uncertainty and value-loading"* (Funtowicz *et al*., 1999).

4.2.2 Outcomes from the characterisation of the context

In addition to providing a contextual frame of reference for the book, the second chapter offered the following outcomes:

- **Change of epoch**: The ongoing changes in the rural context are a situated expression of an on-going change of epoch; the vulnerability of individuals as well as of RR&D organisations is the most widely observed consequence. While the new epoch establishes itself, the current rules of the development experience a crisis of legitimacy and individual and collective actors experience a crisis of perception and interpretation. Under these circumstances, it is impossible to get out of the organisational vulnerability under the same rules of the game, worldview and theory of action that have created it.
- **Actor's configurations**: Due to the influence (often interference) of regional and global actors in local processes, it is necessary to consider the network of relationships among local and national actors, as well as the role of theories of action of external actors, regarding the institutional innovation of RR&D organisations.
- **Relevance of current research**: Despite privatisation processes in Panama and LAC, the Public RR&D organisations will continue to be important actors, in rural transformation. Therefore, the study of institutional change processes in public RR&D organisations maintains its relevance.
- **New actors in rural development**: Rural NGOs are occupying the space left by the state in RR&D efforts. As NGOs are carriers of new wholeness oriented and participatory approaches to cope with complexity, it is important to investigate whether these organisations are applying such approaches to their institutional change processes.
- **Innovation as an emergent property**: Innovation in the rural milieu is no longer the outcome of applying a science focused on delivering "*the best technical means*" to achieve the given goals of productivity and competitiveness. Instead of just being the product of fundamental and/or applied research by agricultural scientists, innovation is increasingly seen as the emergent property of the interaction among not only researchers, extension workers and farmers, but also increasingly concerned NGOs, other resource users, consumers and industries, among others.

The methodological research strategy has to grasp the dynamic, interactive, multi-actor character of on-going institutional innovation processes in selected RR&D organisations as well as their multiple determinations. The influence of the relevant context on and its (re)construction by social actors of RR&D organisations involved in institutional change processes have to be considered.

4.2.3 Main outcomes from literature review

From the review of literature presented in the third chapter the following outcomes stand out:

- **Institutionalisation:** RR&D organisations have different degrees of institutionalisation depending on how they have defined, made explicit and practised their "*rules of the game*". Then, the methodological strategy must allow their identification at different organisational levels. In addition, to assess -organisational vulnerability, it is important to investigate the internal consistency - *coherence* - of the rules of the game and their external consistency - *correspondence* - with the realities, aspirations and necessities of RR&D organisation's stakeholders in the relevant external context.
- **Tacit knowledge*:*** Institutional change has to do with changes in tacit knowledge both at individual and organisational levels. The cognitive dimension of tacit knowledge includes the mental models, beliefs, values, schemes and perceptions that influence the way actors think and act. Tacit knowledge is a product of the interaction between individuals or groups in the

context of the networks of relations and chains of events that they influence in their daily work, that as well are influenced by the perceptions and actions of these actors. These social networks of relations (or "*informal structure*", "*deep structure*", "*structural principles*", "*tacit organisation*", "*inner world*"), provide organisational space for socialisation and externalisation of tacit knowledge through communication. An interpretation of these processes will require an interactive systemic methodology able to apprehend their epistemic nature.

- **Praxeology**: All practices are influenced by one or more theoretical approaches, even though those who execute this practice are not conscious of the influence of these approaches. *Praxis* emerges from the conscious fusion of a practice with the theory that informs it. For that reason, there is always more than one way to achieve the same purpose; there is always more than one **theory of action,** which is ***a set of principles of behaviour, shaped by paradigms, worldviews, theoretical and methodological premises to inform the way a given organisational purpose must be achieved in an effective way***. Different theories of action reveal different values, meanings and interests that are reflected in the principles, premises, promises and commitments that mould the practices that they inform. Indeed, the change of theory of action implies a change of principles, premises, promises and commitments - ontological, epistemological, methodological and axiological - that orients actors' praxis. The study of the different theories of action (explicit or not) that inform institutional innovation processes is what I call here the ***praxeology of institutional innovation***.
- **Institutional coherence**: As in Habermas' distinction of types of actions or rationalities (instrumental strategic and communicative) related to different human 'worlds' or dimension, it is important to distinguish here between scientific paradigms, social worldviews and cultural worldviews, which to a great extent determine these actions. Regarding RR&D organisations, one can expect to find that these dimensions of human action are configured in such a way that they tend to be **internally consistent** in dependency on their degree of institutionalisation.

4.3 General research questions

This research attempts to critically examine the state of the art of institutional innovation and to identify the theories of action informing it in RR&D organisations. The general aim of this study is to better understand the processes, under which theories of action for management and facilitation of institutional innovation are generated, reconfigured and appropriated by participant actors. The purpose is to contribute to the construction of a new theory of action for the management and facilitation of institutional innovation in RR&D organisations.

The following general research questions were formulated to guide the process of inquiry:

1. What are the main theories of action that inform the processes of institutional change and innovation in RR&D organisations?
2. How does institutional change in RR&D organisations reflect the contradictions of the change of epoch and the development of a new paradigm of institutional innovation?
3. How do change agents develop and deploy alternative theories of action in such a way that they can overcome the limitations imposed by the mainstream?
4. How are institutional innovation processes affected by (and how do they affect) the theories of action of donors and external facilitators?
5. What are the external and internal factors facilitating (or hampering) the institutional innovation process in RR&D organisations?

A set of more specific sub-questions is presented for each of case studies in the respective chapters.

4.4 Methodological perspectives

Just as there are various philosophical perspectives, which can inform qualitative research, so are there various qualitative research methodological perspectives. A research methodological perspective is a strategy of inquiry which moves from the underlying philosophical assumptions to research design and data collection. The choice of guiding methodological perspective influences the way in which the researcher collects data.

After reviewing some of the methodological perspectives relevant to the study of institutional innovation, I chose the following valuable perspectives for guiding my research.

4.4.1 Soft systems thinking

Soft systems methodology (SSM) was developed in the 1960s by Peter Checkland, at Lancaster University (Checkland, 1981, 1989; Checkland & Scholes, 1990). This methodology arose out of attempts to apply systems engineering principles to business problems, incorporating emergent (unexpected) properties of "*human activity systems*" because of "*complex feedback loops among system components*" (Checkland, 1981).

When applying systems engineering to human activity systems, Checkland found a number of difficulties. Organisation goals were matters of controversy; in particular, most investigators assumed that all members of the organisation accepted goals set by top management, but this is usually not the case. Formal methods usually begin with a problem statement; Checkland found that fixing the problem too early made investigators unlikely to see different, possibly more basic, problems. Finally, the method itself can restrict what will be elicited - conclusions will reflect methods and starting positions. To overcome these difficulties, Checkland proposed the SSM, as a seven-step process. From his earlier work (Checkland, 1981), these steps were:

1. Determine the problem situation and the key actors (CATWOE analysis).
2. Use "*rich pictures*" to express the problem situation.
3. Select root definitions of the relevant system.
4. Build a conceptual model.
5. Compare the expressed and conceptual models.
6. Agree on feasible and desirable changes.
7. Take action to improve the problem situation.

In later descriptions such as that by Checkland (1989), the focus is more upon comparing reality to a set of conceptual models, and less upon a step-by-step process for doing this. Checkland moved towards seeing "*SSM as an inquiring process. And that in turn established the 'hard/soft' distinction in systems thinking*" (Checkland, 1989:279).

The described soft system methods have been criticised for being grounded in an objectivist epistemology, which reflects some of its limitations. In order to transcend these limitations, new perspectives have been developed under the influence of constructivist or contextual relativist epistemology. Two of these approaches with regard to rural human systems are summarised: Agricultural Knowledge and Information Systems (AKIS) and Critical Learning Systems (CLS).

4.4.1.1 Agricultural knowledge and information systems

The Communication and Innovation Studies Group of Wageningen University & Research Centre has used "soft systems thinking", to design the Agricultural Knowledge and Information System (AKIS) as an analytical tool, "*to understand and improve existing configurations of*

institutions and design better ones" (Röling and Engel, 1991:125). Unlike conventional systems design methodologies, AKIS does not assume that 'systems' exist objectively (see Table 4.1). Instead, plural systems that may be relevant to change are constructed and articulated, based on the interest, perspectives and worldviews of participants.

Table 4.1 A comparison of hard and soft systems thinking

Hard systems thinking	Soft systems thinking
The world is systemic…or can be taken as if…	The world is not systemic…but sometimes it is useful to take it as if ….
Images are to be systemic …	Systemic images are used when this is helpful
The methodology of inquiry may be systemic	Methodology is designed as a system, possibly a learning system …
System images are used to construct models to represent the world (or part of it) …	System images are used to construct windows to study the world ….
System images are concerned with processes, inputs and outputs….	System images concern social actors, their activities and relationships ….
The aim of hard systems thinking is to improve one's knowledge about the world by improving one's models….	The aim of soft systems thinking is to improve human performance through debate and reflection…
Processes are functionally articulated into a goal-seeking whole…goals are inherent in the whole.	Social actors may behave as a systemic whole – if they wish and know how to do this… boundaries and goals are permanently negotiated or renegotiated.

Source: Engel, 1997.

According to Röling, the knowledge system can be described as *"…the articulated set of actors, network or organisations expected or managed to work synergically to support knowledge processes which improve the correspondence between knowledge and environment and/or the control provided through technology use in a given domain of human activity*" (Röling, 1992, quoted by Coutts, 1994:43).

AKISs are social constructs; they exist only to the extent that people agree on their goals, boundaries, membership and usefulness. A process of institutional innovation can be seen as a 'knowledge system' so that the internal and external actors can interact, creating and reshaping knowledge, negotiating conflicting goals and perspectives, to change RR&D organisations and their institutional dimension.

4.4.1.2 Critical learning system

A critical learning system (CLS) is a soft system perspective developed by Hawkesbury collective at the University of Western Sydney in Australia that integrates the concepts of experiential learning, and systemic and critical thinking. It recognises that individuals experience the world differently and use different "*meta-cognitive processes and epistemic developments"* in deriving meaning from their experience. It involves individuals in interactions that transcend their paradigmatic assumption as they collaborate to reach a common understanding of problematic situations and to act to improve them. As Bawden (2001) put it, "*the aim is, in collaboration with key stakeholders, to explore issues that are regarded as problematic from specific and explicit contexts, and eventually identify activities that might transform the situation as qualified by the particular worldviews that support such interventions*" (Bawden, 2001:17).

A first step in the construction of such a *learning community* is the facilitation of consciousness of the process of learning itself. As shown in Figure 4.3, CLS could be seen as three levels of inter-connected and emergent systems hierarchies, in which: "*those who constitute learning/inquiring systems must concern themselves with their own systemicity and its sustainability, and with the nature of the processes of inquiry that they themselves are using as*

they go about their 'researching'. This process of ***meta-inquiring*** *must also include* ***epistemic*** *explorations of the nature and influence of different paradigmatic positions on the discourse and the subsequent design of human activity systems for improvements*"(Bawden, 2001:19).

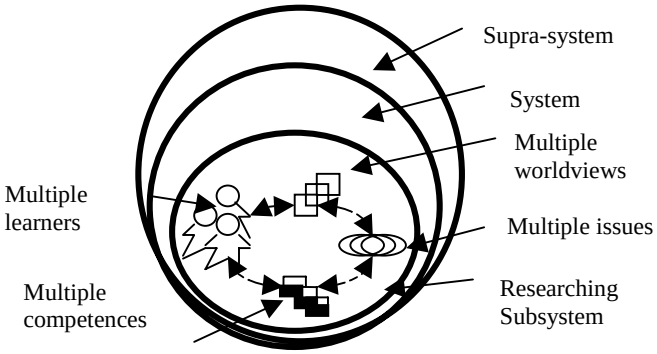


Figure 4.3 Critical learning systems (adapted from Bawden, 2001)

The critical learning sub-system (the researching system), consists of a group of learners or 'change agents/facilitators' within organisations, who have developed *systemic capabilities* that allow them to bring themselves into being as a *community of practice* and bring their system (organisational) and supra-system (inter-organisational) into existence. They must be sensitive to and appreciative of differences (even the profound philosophical ones associated with ontologies, epistemologies and axiologies) that influence their own dynamics and their relationships with the world about them (their supra-systems). According to Bawden, there are five key issues that those concerned with persistence from a holo-centric perspective, must address under the circumstances of any particular problematic situation:

1. "*What is it that needs to be transformed to allow sustainable improvements to be achieved in the face of changing environmental circumstances?*
2. *What worldview/Weltanschauung supports this claim as being the 'right and proper thing to do'?*
3. *Who are all the stakeholders who should be involved in the transformational process?*
4. *What is the nature of the environmental supra-system in which the transformation has to be achieved?*
5. *What therefore are the characteristics of function and form that need to be incorporated into the design of a system to enable changes to be made?*

These factors can be captured in the acronym: T.W.O.C.A.G.E.S.

T - *is the* ***t****ransformation that is (or should be) sought;*
W- *is the* ***w****orldview that provides its justification;*
O- *are those (****o****wners) who hold the power to facilitate and/or constrain the process;*
C- *are the targeted beneficiaries in the community (the* ***c****lients if you will);*
A- *are those* ***a****ctors who will need to be involved for appropriate actions to be taken;*
G- *are the* ***g****uardians who speak on behalf of those who cannot be represented;*
E- *are the* ***e****nvironmental conditions under which the transformation will have to be achieved or in the future might have to be achieved;*
S- *is the specified* ***s****ystem that will need to be designed to allow the transformation to be achieved under the circumstances dictated by all of the other factors mentioned above*" (*ibid.*:19).

A SSM, especially AKIS and CLS, therefore, is appropriate for studying institutional innovation processes, in which people interact, creating and reconfiguring knowledge, negotiating conflicting worldviews, goals and perspectives. In fact, I have used the AKIS perspective to identify RR&D organisations and their configurations in Panama (see section 2.2.1). With regard to CLS, its emphasis on experiential learning, self-reflection, future orientation and learning communities crucial to understanding the dynamics of innovation processes.

4.4.2 Case study research

Although there are numerous definitions, Yin (1998) defines the scope of a case study as: "*a process of empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when:*

- *the research process is based on the reliance on multiple sources of evidence; and*
- *the boundary between the phenomenon being studied and its context is not clearly evident*" (Yin, 1998:237).

According to Yin, there are four principles for assuring high quality case study analysis:

1. "*Show that you examined and entertained all relevant evidence, in an exhaustive manner.*
2. *Include the major rival interpretations, and use your evidence to address these rivals.*
3. *Focus on the most significant research questions that initially led to your case study, to show that your analysis did not merely follow the path of least resistance.*
4. *Compare your analytic procedures and finding to as much prior research as possible, to show that you have tried hard to build on research rather than reinvent it*" (*ibid.*:255).

Clearly, the case study research methodological perspective is particularly well suited to research on institutional innovation, since the 'object' is the study of interactive processes within RR&D organisations. In addition, the case study research has a strong advantage considering my commitment to the process of generating knowledge in the context of its application and implications.

4.5 Analytical framework for the research on theories of action

In addition to the above stated outcomes (premises and assumptions) based on the previous chapters and their methodological perspectives, the analytical framework includes the definition of levels of study and the analytical tools (matrices) for the study of theories of action that are presented in this section.

Levels of study on theories of action in RR&D organisations

A theory is a framework that articulates concepts and establishes associations, in an attempt to contribute to giving meaning to the web of original connections and networks of emergent interactions that characterise the complex phenomena that are necessary for understanding. Argyris & Schön (1978) distinguished between theories created "*to understand and predict*" and *"theories created to help people make events come about*". The latter, they have called "*theories of action*" (Argyris & Schön, 1978:5).

With respect to RR&D organisation, the distinction proposed by Argyris & Schön, between theories and theories of action is important, but very often organisations have defined more than one theory for understanding. Commonly, they have what is called a 'conceptual framework' that includes premises, hypotheses or assumptions, concepts and theories associated to rural transformation. I prefer to call this set of theoretical elements the organisation's mode of interpretation. Any purpose can be achieved in many ways, but not just any way. From their mode of interpretation and value frameworks RR&D organisations have derived their theory of

action**,** which is a set of principles of behaviour, informed by paradigms, worldviews, theoretical and methodological premises, to inform the way a given organisational purpose must be achieved in an effective way.

As was noted in chapter 3 (section 3.2), instead of the binary distinction between organisation and institution, I have proposed a more continuous concept of *degree of institutionalisation*. Depending on the degree of institutionalisation of RR&D organisations, their rules of the game, mode of interpretation and theory of action are more or less explicit. This does not mean that they do not have them at all. These elements of their institutional dimensions may be consciously implicit or else the organisations are just 'followers or imitators' of more institutionalised actors.

In Figure 4.4, three interrelated levels of the study on the theory of action for institutional innovation are represented. These levels are related to the *degree of institutionalisation* and are: i) the level of organisational *praxis*; ii) the level guiding institutional frameworks; and iii) the level of the value framework. At the level of organisational practices, one can infer the *implicit theory of action* for institutional innovation from observing and analysing the organisational behaviour.

Among others, the following dimension of organisational *praxis* seems to be more important for identifying the implicit theory of action for institutional innovation: the way of learning, change practice, management model, facilitation practice, organisational configuration, development of strategies, participatory practices, time orientation.

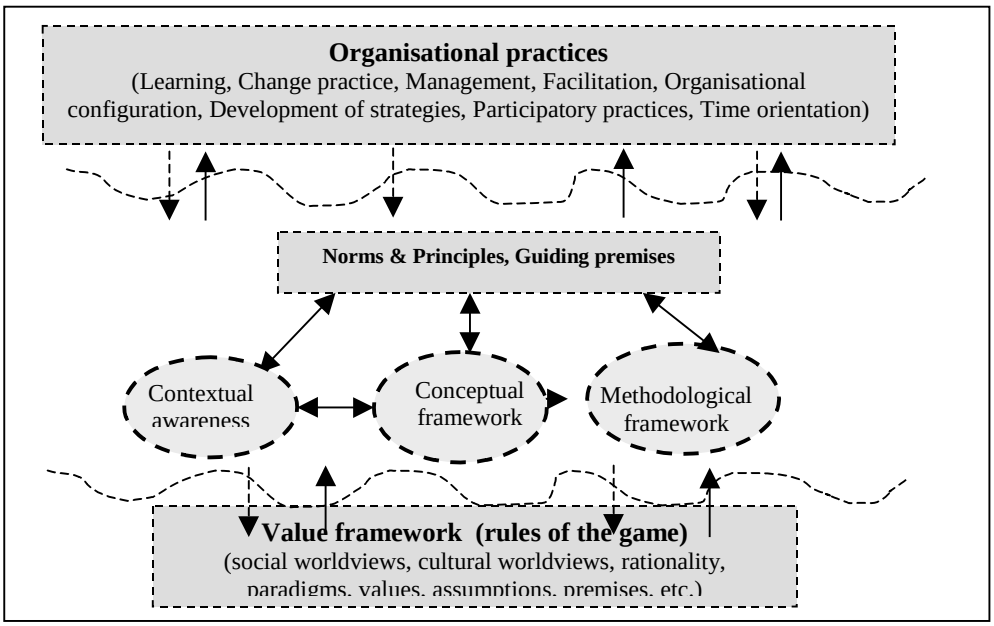


Figure 4.4 Different levels of study on theories of action for institutional innovation

While many RR&D organisations have not made explicit their theory of action, some of them have adopted *organisational guiding frameworks*, such as contextual awareness, conceptual frameworks, methodological frameworks and norms and principles. At this level, the study of theories of action can be complemented by means of interpretative content analysis of organisational documents. For this kind of study, the distinction proposed by Argyris & Schön between *espoused* theory of action and *theory-in-use* seems useful. As they puts it, "*organisations have theories of action which inform their actions, espoused theories which they announce to the world and theories-in-use which may be inferred from their directly observable behaviour*" (Argyris & Schön, 1978:11).

Very few organisations have made their value framework as explicit as they are here conceived. The identification of communities of practice within the organisation and the critical self-assessment of their rules of the game by constituent actors can help the study of institutional innovation at this level.

The three interrelated levels in Figure 4.4 can also be seen also as different levels in which organisational learning occurs (Argyris, 1992; Kitchener, 1983; Broekstra, 1998; Bawden, 2000).

- **Single-loop learning:** when organisational practices are changed without questioning the reasons, why they do not performing appropriately;
- **Double-loop learning:** meta-learning or second order change, in which learning occurs through a process of joint inquiry into the norms, principles, hypothesis, conceptual and methodological guiding frameworks of the whole organisation;
- **Triple-loop learning** or **epistemic learning:** involves questioning established mindsets, through a designed critical self-reflection about worldviews**,** rationality**,** paradigms, theories, values, etc.

Indeed, to identify theories of action for institutional innovation in RR&D organisations is necessary to assess their degree of institutionalisation and to examine the internal consistency among the value framework (rules of the game), mode of interpretation and perception of the context. Additionally, the analysis of internal consistency should verify the consistency of the theory of action (implicit or explicit) with the organisational practices.

Analytical tools (matrices) for the identification of theories of action in RR&D organisations

The following two matrices will be used to analyse and compare different dimensions of theories of action and organisational practices for institutional innovation within RR&D organisations. Tables 4.2 and 4.3 will allow the analyses of different experiences of institutional change within one organisation as well as to compare them between two or more RR&D organisations. In Table 4.2 the selected dimensions of theories of action are related to the organisational value framework (see also Figure 4.4). The idea behind the Table 4.2 is that different combinations of these dimensions (that tend to be internal consistent) within studied cases could be identify and seen as a coherent theory of action for institutional innovation.

Table 4.3 Dimensions of theories of action for institutional innovation in RR&D organisations

Dimensions of theories of action	**Different change experiences**		
Rationality (Instrumental, strategic, communicative)			
Paradigms (In Figure 1.2 they are: techno-centric, eco-centric, holo-centric and ego-centric)			
Social worldviews (mechanistic, economic, evolutionist, holistic) and **Image of organisation**			
Cultural worldviews (In Table 3.1 they are: hierarchy, individualism, egalitarianism, fatalism)			
Conducive policy framework			
Driving forces of institutional change			
Perception of the context			

Using the Table 4.3, different organisational practices that are relevant for institutional innovation will be analysed and compared (see also Figure 4.4). Additionally, this matrix will be used to examine the consistency of organisational practices with the combinations of elements in Table 4.2 within each studied case.

Table 4.1 Organisational *praxis* for institutional innovation in RR&D organisations

Organisational practices	Different change experiences		
Type of change practised			
Way of learning about institutional change			
Facilitation of institutional change			
Configuration for change			
Management model of institutional change			
Participation of internal and external actors			
Development of strategies for institutional change			
Time orientation of changes			

The next section discusses the selection of the research cases, which are presented in chapters 5, 6 and 7.

4.6 The selection of the cases

The analytical framework above presented was used to reflect and learn about institutional innovation processes in which I have participated as manager, researcher, and facilitator. My involvement in the capacity development processes in RR&D organisations in LAC during the last decade has allowed me to actively participate and/or closely observe the different dynamics of institutional change processes in these organisations. Due to time and financial constraints for fieldwork activities and due to the real possibilities of conducting additional research activities, the number of cases was restricted to three:

- **Institutional change of IDIAP**: IDIAP is a public R&D organisation in charge of agricultural research and responsible for 'transferring' its results to extension agents. The extension service in Panama is part of the Ministry of Agricultural Development (MIDA). In 1995, a change process was initiated in IDIAP, which involved greater participation of producers and extension agents in strategic planning of research and all the processes of generation of technology. The main goal of this process was to fit the generation of agricultural technology with the demands and necessities of the context. I was the national co-ordinator and intellectual leader of IDIAP's institutional change process. Since I was the "*local focal point*" in the framework of collaboration of the IDIAP and the ISNAR PM&E project, I was in charge of 'systematisation' of IDIAP experience on

institutional change. Later on, I decided to study IDIAP's process of institutional change as part of my academic research. IDIAP became a case study in the research that was reported in the MSc thesis entitled: "*Institutional Change in Science & Technology Organisations in Panama*" (Santamaria, 2001). Chapter 5 continues with expanding and analysing this case study more deeply.

- **Institutional innovation in environmental NGOs in Panama**: Considering the role that NGOs have been occupying in the rural development effort, the voluntary character of their membership and their adherence to rising paradigms such as environmental sustainability, I decided to include the study of their experiences on institutional innovation in my research. During an exploratory research study between July and November 2001 in Panama, I applied a questionnaire to 17 Environmental NGOs and had the opportunity to participate as observer in three workshops of two different environmental NGOs. These ENGOs have been participating in two different institutional strengthening programs: the USAID and the NATURA Foundation programs, respectively. Personally, I worked as a facilitator at the NATURA Foundation program. The ENGO's case is presented in chapter 6.

- **The institutional innovation process of the ISNAR New Paradigm project**: The NP project is a capacity-building project carried out by ISNAR in LAC.The ISNAR "New Paradigm" project is a social experiment, a research-based service aiming at generating knowledge in the context of its application and facilitating context-based institutional changes in Latin America and The Caribbean. Working with pilot cases at the regional level, mainly of agricultural science and technology organisations, the project has not only supported institutional change processes, but has also innovated itself. Since March 1996, I joined the project as associate professional. Having started my doctoral study in April 1999, I decided to continue participating in the project's activities and to design a case study on its innovation process. The epistemological and historical reconstruction of the institutional innovation of the project theory of action is presented in chapter 7.

The selected case studies are different in their organisational configuration and in the scope of their interventions. On the other hand, they are similar with regard to their basic function as RR&D organisations, aiming to contribute to rural development efforts. In addition, it is important to stress here that the managers of these organisations agreed to participate in my research, and effectively collaborated throughout the research process. In the cases of the New Paradigm Project and the ENGOs, the collaboration included my participation in workshops and the realisation of a feedback workshop with the participation of the regional team of facilitators and NGO's activists respectively. In the case of IDIAP, it was only possible to conduct a semi-structured interview during the fieldwork in 2000.

4.7 General research techniques for data collection and analysis

The deliberate adoption of a paradigm literally permeates every act associated with inquiry. This is why the selection of research techniques and methods demands rethinking to bring decisions in line with the assumptions embodied in the paradigm itself. As Bawden put it, "*holo-centric methodologies reflect a collective praxis in which values, theories, practices and contexts are all made quite explicit through the methodological process*" (Bawden, 2001: 20).Therefore, the chosen techniques and methods of information collection and analysis have to be flexible enough to allow the expression of the worldviews, values and theories of the actors of institutional innovation processes studied.

Moreover, Denzin and Lincoln pointed out the methodological implications of doing research under a constructivist paradigm, in terms of research design: *"such a design usually shows less focus on: 1) well formulated hypotheses; 2) a clear distinction between formulation of hypotheses and their testing; 3) tightly framed sampling frames; 4) structured interview schedules; and 5) predetermined research strategies, methods and forms of analysis"* (Denzin & Lincoln, 1998, quoted by Groot, 2002:42).

Additionally, due to my double role as both researcher-observer and facilitator of institutional change, the techniques and methods should include the opportunity to triangulate data and information from different sources to enhance the *quality* of research.

Finally, especially in the New Paradigm case study, together with other facilitators, I developed concepts, approaches and other methodological insights that were tried out in concrete situations. During and after the application phase, we discussed the experience, drew lessons and if necessary reconfigured the conceptual and methodological 'tools'. As with "*action research methodologies*", the results of this study will regard both understanding and change. The understanding achieved was able to inform action and has also been informed by it in a kind of learning spiral.

On the basis of these considerations, I carried out qualitative research to address the research questions. To gather the information, the following techniques were used:

Participatory action-reflection: Participatory observation is one of the most important sources of information in qualitative research. Observation is the selection and recording of behaviours of people in their environment. Observation is useful for generating in-depth descriptions of organisations or events. Participatory observation is a period of intensive social interaction between the researcher and the subjects, in the latter actors' context. It assumes that people are constantly in a process of interpretation and (re)definition as they move through various situations that are more or less familiar to them. People develop shared perspectives through social interaction. The researcher must become a *participant* in the interactions while also maintaining the stance of an *observer*, someone who describes the experience.

In Participatory Action-Reflection[24], the role of the researcher-observer and of the actor-facilitator in the researching system are intertwined. Participants are involved in collective action and reflection through the negotiated interpretation of the processes, from which lessons are derived to transform perceptions, decisions and actions. The researcher-observer is just one more of the participants. One of the advantages of this research praxis is that the researching system can benefit from the fact that the researcher-observer is a member of other communities of practice and as such, acts as a 'link' between the two social networks. On the other hand, the researcher-observer can analyse and debate his (her) field's experiences and findings with other social scientists and practitioners, enhancing the spectrum of possibilities and alternatives to deal with the issue at stake at the local level.

[24] The issue of being researcher-observer and an actor of the researching system simultaneously is part of the on-going methodological debate among CIS's researchers (e.g., Groot, 2002; Pijnenburg, 2003, forthcoming; Guijt, 2003, in preparation). Pijnenburg (2003) has proposed to call this research process praxis: "*Actie-Begeleidend Onderzoek*" (Pijnenburg, personal communication). I prefer to call it Participatory Action-Reflection to stress the participatory action and the negotiated and self-reflective interpretation of the processes by participants.

The insights obtained through Participatory Action-Reflection were validated by 'triangulation' with other sources of information, such as interviews and secondary data and their adequacy checked through a reflective feedback workshop and peer review.

Structured questionnaire: This type of data and information collection was used to gather information about ENGOs in Panama. The questionnaire was distributed to more than 30 ENGOs and 17 of them responded to the questionnaire. In structured interviews, researchers ask the same set of questions, in the same order, using the same words, to different interviewees.

In-depth semi-structured interviews: These were conducted with key actors of institutional innovation processes to identify other actors, and offered relevant information about the perception, rationality and experiences of participant actors. Sometimes called "guided" interviews, the researchers prepare interview guides that consist of a set of questions.

No attempt was made to obtain a random sample of interviewees. Rather, the sample was "*purposive*" and "*theoretical*"; that is, "*based on emerging understanding of the topic under investigation*" (Altheide, 1996:33). Interviewees were identified using a snowball technique and seen as key informants. The intent of the interviews was to maximise variation in responses so as to gain as complete a view as possible of the networks that make up the institutions and the process of institutional change (Strauss, 1987). In total, 48 individual interviews were conducted[25]. Since the interviews were semi-structured, the questionnaires were used as guides to probe for salient issues, and to provide structure when necessary.

Throughout the research process, the researcher tried to be honest with those who were involved in the research, and explained his aim openly, his background and his status if they asked. In each interview, he identified himself, briefly explained the outline of the study, and answered interviewers' questions until they were ready to accept the interviewer's role.

After each interview, the researcher tried to: 1) understand the meaning and implications that emerged from the interview; 2) analyse what he queried and what response he received; 3) refine research questions and develop working themes; and then 4) prepare the next interview based on the emergent questions and themes. Interaction between data collection and data analysis contributed to the improvement of interviews. Most interviews were conducted by appointment, in staff member office hours for about 45 minutes to an hour each. Assuring the confidentiality of the interviews, the researcher took notes and, by agreement with interviewers, tape-recorded 26 of interviews. All recorded interviews were transcribed after the field research for deeper analysis.

Interpretative content analysis: Altheide (1996) has suggested the term *ethnographic content analysis* for qualitative content analysis focused on the situation, setting, styles, images and nuances that emerge from the reflective interaction of investigator, concepts, and data collection during the document analysis. It is also oriented to: "*documenting and understanding the communication of meaning, as well as verifying theoretical relationships*" (Altheide, 1996:16). I have used interpretative content analysis when considering the organisational document as a product of social construction. Therefore, the documents were analysed in two ways. On the one hand, they provided factual, contextual and historical information about institutional changes. On

[25]Because many interviewees do not speak English, I tried to edit quotations for English comprehension without changing their original meaning.

the other, the content of the documents was analysed and interpreted to identify the underlying worldviews, assumptions and major elements of organisational modes of interpretation and theories of action for institutional innovation.

Apart from primary information, secondary information was also collected from different sources. For this, office records (published and unpublished information) of concerned organisations, planning documents, and other relevant matters were collected. Collected documents include: 1) internal organisational structure descriptions; 2) inter-organisational and intra-organisational networks descriptions; 3) descriptions of institutional strengthening activities (or change processes); 4) documents on organisational history; and 5) statements of organisational missions, objectives and strategies.

Group discussion and peer review: The main finding of the New Paradigm and ENGOs case studies were presented and discussed in **reflective feedback workshops** with the NP project team of regional facilitators and with ENGO's activists. During the workshops I made a presentation of 'the case study' as well as the main research findings, followed by a plenary session for discussions. Then, the participants in these workshops worked in-group and presented their conclusions about the innovation process, its factors and lessons and presented them in plenary for discussion. The results of these workshops were incorporated into the research report. Finally, my 'peer facilitators' of the New Paradigm project reviewed the manuscript of chapter 7 and made comments and suggestions that were fully or partially incorporated.

While I began the data collection process from a theoretically informed position, I allowed conceptual development to *emerge* from the inquiry process. The process of gradual shaping meaning through understanding and interpretation was sufficiently flexible to allow for unexpected contingencies that affect both the unfolding of the studied institutional change processes and the course of the inquiry itself.

4.8 Limitations of the scope of the research

This study is not intended to lead to generalised findings and conclusions to be applied to other organisations and contexts. But, faced with the same situation, actors in other contexts can find some conceptual and methodological recommendations here that they will need to socially, culturally and contextually reconfigure. The study is limited to the analyse of rules of the game concerned to theories of action for institutional innovation in rural developemnt organisations. Time and financial limitations did not allow me to conduct more interviews and to incorporate other related experiences of institutional innovation that could be relevant for complementing this research. Nevertheless, in general, the empirical part is coherent with the theoretical discussion and provided legitimacy for answering the research questions, making recommendations and theoretical proposals.

Chapter 5. Institutional Innovation of the National Agricultural Research Institute of Panama

5.1 Overview

As was described in Chapter 2, Panama as with the rest of Latin America, is experiencing great changes in its RR&D organisational matrix, as a result of the turbulence caused by the ongoing changes in the global and regional contexts. Due to the decline of the prevailing paradigms and economic models in the last decades, the Panamanian government and multilateral international agencies have been promoting the transformation of agricultural public R&D organisations. The National Agricultural Research Institute (IDIAP) is among those organisations that have undergone a process of institutional change.

In 1995, a change process was initiated in IDIAP, which involved greater participation of staff members as well as producers and extension agents in the strategic planning of agricultural research and transfer of technology. The purpose of this process was to fit the generation of agricultural technology with the demands and necessities of the context.

This chapter presents IDIAP's institutional change process as a case study of institutional innovation. It begins with the research design, followed by an analysis of changes undergone by IDIAP at different periods of time, with an emphasis on changes that affected its mode of intervention. The changes are analysed guided by the research questions and methodological and theoretical premises presented in previous chapters. Then, using the above-presented analytical framework, the theories of action that informed these changes are analysed and compared. Finally, the main conclusions and remarks concerning this case are presented.

5.2 Research design

The general aim of this doctoral research is to better understand the processes by which theories about management and facilitation of institutional innovation are generated, reconfigured and appropriated by participant actors. For this case study, the specific aim is to re-interpret IDIAP's process of institutional change and to make visible the worldviews and theories that informed it.

5.2.1 Research questions

1. How does the institutional innovation of IDIAP reflect the contradictions of the change of epoch?
2. What are the theories of action that inform the institutional innovation processes in IDIAP?
3. What are the driving forces of the institutional innovation processes in IDIAP?

5.2.2 Research methods and techniques

Over a period of three years, between 1995 and 1998, I was the national co-ordinator and one of the intellectual leaders of IDIAP's institutional change process. As national co-ordinator, I participated in all activities carried out during those years. Since I was the "*local focal point*" in the framework of collaboration of the IDIAP and the ISNAR PM&E Project, I was in charge of

the systematisation of IDIAP's experience with institutional change. This systematisation included accomplishing self-reflective workshops, participatory monitoring and evaluation of the process of change, writing periodical reports and making presentations about these experiences at conferences and regional workshops. The results of the systematisation of IDIAP experiences on institutional change have been published by IDIAP and ISNAR (e.g., Santamaria & Sarmiento, 1997; Mato *et al*., 1997; Mato *et al*., 2000).

As was stated in the previous chapter**,** my role in the facilitation and systematisation of the institutional change process can be seen as **participatory action-reflection**. At the same time as being with other professionals developing conceptual and methodological tools within the ISNAR PM&E project, I participated in their application, validation and reconfiguration exercises during IDIAP's process of change of. Moreover, managing and facilitating IDIAP's institutional change process allowed me to gain experiences that were shared with other professionals in the process of collective construction and appropriation of knowledge in the PM&E project. Later on, I decided to study IDIAP's process of institutional change as part of my academic research. IDIAP became a case study in the research that was reported in my MSc thesis, entitled "*Institutional Change in Science & Technology Organisations in Panama*" (Santamaria, 2001). The present chapter continues by expanding and better analysing this case study.

Interpretative content analysis of IDIAP's documents: These documents were analysed in two ways: On the one hand, they provided factual and historical information about IDIAP's changes. On the other, the content of the documents was analysed and interpreted to identify the underlying worldviews, assumptions and major elements of IDIAP's research model and theory of action for institutional innovation. The documents analysed include published IDIAP materials, published and unpublished workshop reports, synthesis documents of group discussions, internal reports and communications.

Interviews with key informants: A semi-structured questionnaire (see Annex 1) was developed and used as guide during the interviews with key informants (staff members, project managers, regional and national directors). A total of 26 interviews were accomplished.

Group discussion: The experience derived from three years of developing of IDIAP's process of institutional change was evaluated in a series of critical self-assessment workshops, held in 1998. Participants came from all regional research centres and IDIAP headquarters, as well as including representatives from the National University of Panama, Faculty of Agrarian Sciences, The Bank for Agrarian Development, The National Marketing Institute of Agricultural Products, and the Ministry of Agriculture. I was one of the facilitators of these workshops and was in charge of writing and editing IDIAP's reports (IDIAP, 1999a) on the self-evaluation process. A consolidated report on "*changes in pilot cases*" was written and published by ISNAR (Mato *et al.,* 2000).

The next section presents the main characteristics of IDIAP's mode of intervention starting with its creation in 1975.

As with the majority of NAROs in Latin America (see section 2.3.1), the creation of IDIAP was 'inspired' by the USA Land Grant College (LGC) model. Nevertheless, the uncritical implementation of the LGC model in others countries, ignored the history and culture and the context in which its system was developed. As Goldsmith (1988) described it, this was a long period of trial and error that started in the second half of the 19th century to finally create a

"*sophisticated network of institutions capable of mass education, advanced technical training, scientific inquiry, and organisational work among farmers. The universities, experimental stations, extension workers, and farmers' organisations formed a powerful rural lobby that was able to obtain economic resources and favourable policies from state and local government"* (Goldsmith, 1988:319).

5.3 Supply-driven IDIAP (1975 - 1994)

IDIAP was created in August 1975 as a governmental organisation, with its own patrimony, and administrative, financial and technical autonomy, with the purpose of reorienting and intensifying agricultural research, that in that time was mainly characterised by the adaptation of foreign technologies. Despite its 'autonomy', IDIAP follows the policies and directives of the Ministry of Agricultural Development (MIDA). In fact, IDIAP's administrative board is presided by MIDA's Minister.

Therefore, the core of IDIAP's research programs reflected the prevailing economic model of development and the concomitant agricultural development policies. Indeed, at the time of the import-substitution model of development in Panama (1970 - 1982), the core research programs were beef and dairy cattle, basic grains (rice, corn, sorghum and beans), roots and tubers (potatoes and cassava), sugarcane, and horticulture (tomato and onion). These programs carried out research activities aimed "*to increase production and productivity in order to replace imports and, where possible, achieve self-sufficiency in the production for internal markets*" (IDIAP, 1979:3).

Influenced by the international agricultural research centres (mainly by CIMMYT, CIAT and CIP) and the '*green revolution paradigm*', the research programs had a strong plant-breeding component oriented to introduce, evaluate, adapt and generate high-yielding varieties of the basic food crops. In 1979, IDIAP's mandate was "*to raise the production and productivity, as well as the income level of agricultural producers, with emphasis on small producers*" (*ibid*.:1).

In 1979, IDIAP signed an agreement with the Agency for International Development of the United States of America (USAID) to launch a five-year institutional strengthening program. The goal of this program was to strengthen the physical infrastructure and to provide support for the qualification of its technical personnel. The program's implementation led to the construction of many administration buildings (research centres and sub-centres) and laboratories. The basic infrastructure for the three major regional research centres was built: Western Research Centre (central headquarters, 3 sub-centres, 1 experimental station and 2 experimental farms, 1 experimental field and 2 laboratories), Central Research Centre (Central headquarters, 3 sub-centres, 2 experimental farms, 1 experimental field and 3 laboratories), Southern Research Centre (Central headquarters, 2 sub-centres and 1 experimental field). In addition, these new facilities were supplied with the necessary machinery and equipment for research and training.

With regard to the training of personnel, IDIAP sent researchers abroad for postgraduate degrees, especially to the USA. In 1982, IDIAP had eight people studying abroad, five of whom were in the USA -three at PhD level and two at MSc level (IDIAP, 1982). Until the end of the USAID program, up to 20 researchers were sent abroad for postgraduate studies. The program also included hiring several 'senior USAID consultants' to in-field support of IDIAP's research activities.

The USAID strengthening program reinforced the supply-driven, disciplinary model of research in two ways. On one hand, as IDIAP's research facilities were expanded and equipped, researchers were drawn to carry out more of their experiments at the laboratories and experimental stations, where they had better conditions for manipulation and control of their experiments.

On the other hand, researchers' postgraduate studies socialised them mainly in the USA LGC model of research and extension that was based on the transfer of technology (TOT) perspective; this is characterised by a *continuum* of generation, transfer, diffusion and adoption of technological innovations. As Horton (1991) pointed out, "*in this model, universities and research centres are seen as the principal sources of new ideas and technologies, which later are transferred by extension agencies to passive farmers-adopters*" (Horton, 1991:220). When these researchers returned to IDIAP, they reinforced the supply-driven and disciplinary character of IDIAP's research model[26].

From 1980 to 1993, IDIAP generally stayed on course with respect to its strong basic grains (focused on the improvement of genetic material) and beef and dairy cattle programs. At the same time, there was a broadening of the research agenda, which was closely connected to IDIAP's 'co-operation' with international agricultural research centres and with the structural adjustment and market liberalisation implemented by the Panamanian government. With regard to co-operation with international centres, the Dual-purpose Livestock Project, funded by the International Development Research Centre (IDRC), the Small Farm Production System Project, funded through CATIE, and the On-Farm Client-Oriented Research Program, with CIMMYT, were among the most important (IDIAP, 1979; Cuellar, 1990). Concerning agricultural policies, the non-traditional export commodities (citrus, melon, watermelon, pineapple and yam) were included in the research agenda as well as special agro-industry, biotechnology, agro-forestry and agro-toxicology programs.

Moreover, as a result of the structural adjustment policies that reduced the participation of the state in agricultural production and services, IDIAP assumed the function and received part of the infrastructure, of the National Seed Governmental Enterprise (ENASEM), which closed down in 1986. With this annexation, IDIAP added to its mandate the mass production of registered seed and became involved in seed drying, cleaning and storage.

After the USA's invasion of Panama in 1989, a partial '*reorganisation*' of IDIAP was carried out in order to allow organisational action to run parallel with "*state policies of liberalising prices and opening markets*" (IDIAP, 1991:1). The '*reorganisation*' just changed the flow chart (see Figure 5.1), creating two big National Research Centres, one focusing on crops and the other dealing with cattle (instead of the four regional research centres that existed at that time).

IDIAP's research model that prevailed from 1975 until 1994 was a disciplinary, supply-driven model of technology development (see Box 5.1).

[26] DiMaggio and Powell (1991) have stated that organisations in general are subject to *isomorphic* processes which cause them to resemble one another and said that one of the commonest mechanisms by which such '*isomorphism'* develops is '*normative isomorphism',* which is carried primarily by professionals, who, because of their cultural socialisation produce similarities across organisational boundaries. The authority of professionals rests primarily on their claims to specialised knowledge and skills (DiMaggio and Powell, 1991).

Box 5.1 **Major elements of IDIAP's research model (1975 - 1994)**

Research paradigm:
- Techno-scientific paradigm, emphasis on 'solving' limiting technical factors affecting the production and productivity of crops and animal products;

Supply-driven model of technology development
- Problem defined internally by scientists;
- Research process designed internally;
- Researchers closely linked with International Agricultural Research Centres;

Disciplinary
- Research programs organised around disciplines;
- Problems emerged out of discipline's history;
- Problems emerged out of disciplinary training of researchers and their socialisation into research;

Communication
- One-way transmission of information from the researcher to extension agent
- Little or no participation of potential clientele;

Financing
- Dependent on the government budget and International centres' programs.

Source: based on IDIAP, 1979,1982, 1987, 1991, 1995; and Middendorf, 2002

The definition of research programs continued following the identification of thematic areas within which contributions to technological development could be made. For example, the national horticultural research program carried out activities for raising the productivity of tomatoes, onions, and sweet peppers in different places all over the country. The program leader was in charge of supervising these research activities and complained that he "*spent most of his time travelling from one place to another*" (Informant 18, this research).

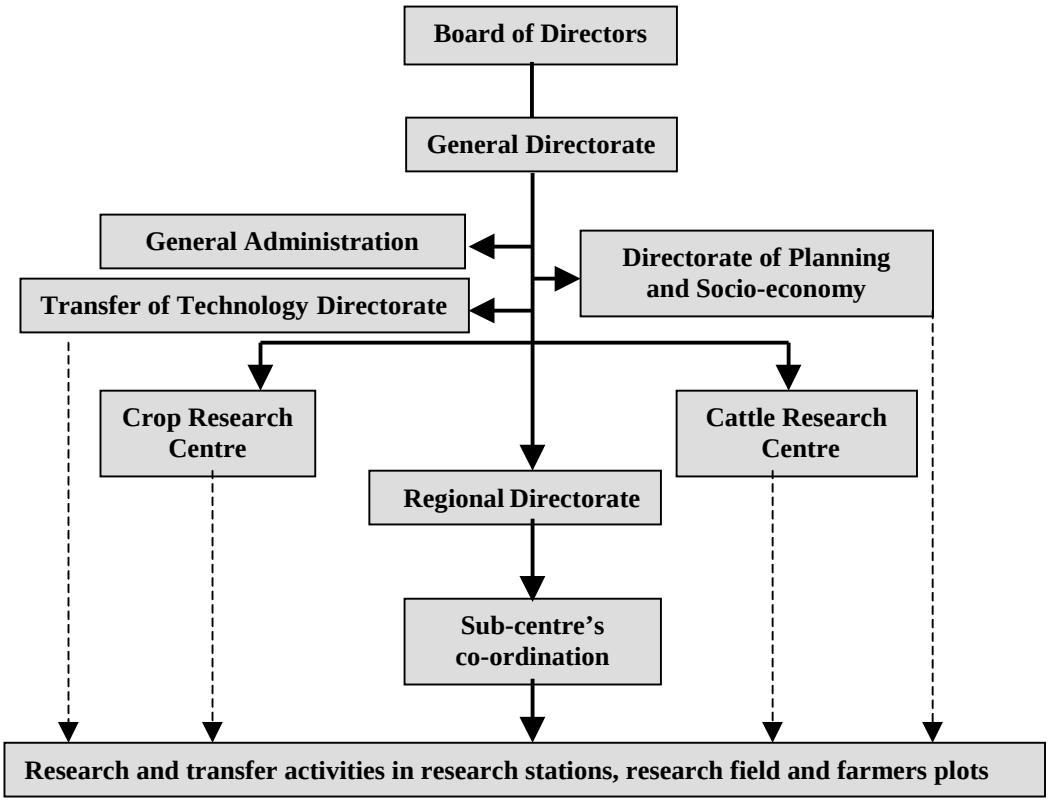


Figure 5.1 Organisational structure of IDIAP in 1991 (IDIAP, 1991)

As with previous changes, the 1990 '*reorganisation*' did not question IDIAP's research model and mode of intervention, but reinforced its hierarchical organisational structure. In 1990, IDIAP's objectives were: (i) "d*esign, promote, stimulate, co-ordinate and execute research activities to produce knowledge and technologies for agricultural development; (ii) to raise production and productivity by commodity or priority agricultural products to improve domestic supply as well as export possibilities; (iii) to raise the income levels of producers, with special attention to small producers and marginalised 'campesinos' facilitating their incorporation into the economic and social activity of agriculture; and (iv) to conserve and use rationally agricultural resources"* (IDIAP, 1991:3). Broadening its agenda was the common response of IDIAP to the re-structuring of public agricultural organisations that formed part of the agreement of the Panamanian government with the World Bank and the IMF.

5.4 Demand-driven IDIAP (1995 - 1998)

In 1994, a change process was initiated, which involved greater participation of IDIAP personnel in strategic planning of research and all the processes of technology generation.

5.4.1 The genesis of change initiative

In the early 1990s, it was clear that the government had decided to implement neo-liberal economic policies, which in large part resulted from the negotiation of the structural adjustment program with the World Bank and the IMF in the 1980s. Specifically, for agricultural public sector organisations, the opening up of agricultural markets through the lowering of barriers to trade and the reduction of the fiscal deficit by means of government austerity had profound implications. In 1994, Perez Balladares's administration (1994 - 1999) intended to continue and even intensify the implementation of the "*Letter of intent*" between the IMF and the previous administration. Among others, the entrance of Panama into the WTO, the privatisation of public basic service companies and the 'modernisation' of public administration were core elements of the reform program.

According to Santamaria & Sarmiento (1997), IDIAP's institutional change initiative emerged from: "*the concern of leading managers about the implications of global and regional trends with regard to agricultural S&T organisations, the further implementation of the state's reform program in Panama and the exhaustion of the potential of IDIAP's mode of intervention*" (Santamaria & Sarmiento, 1997:34).

With regard to global and regional trends, these concerns were not unfounded. During the 1980s and beginning the 1990s, public agricultural research organisations were shut down or drastically restructured in a number of countries in Latin America, such as Bolivia, Peru, Venezuela, Honduras, Costa Rica, as a result of such state modernisation programs (Machado, 1996).

Moreover, in his first year in government, "The Bull" (the nickname for President E. P. Balladares) partially privatised the two larger public service companies, INTEL (telecommunication's services) and IRHE (electricity's service), while the state retained 49% of the share capital. In addition, he advanced the privatisation of the Colon and Balboa ports and promised the privatisation of IDAAN (public water utilities company). At the same time, and as a component of its agricultural policy, the government began negotiating the Agricultural Service Modernisation Program with IDB. This program included a component for 'modernising' the agricultural research and extension system. Indeed, if IDIAP's manager did not decide to initiate an institutional change process, the change would come from MIDA or central government. Therefore, any initiative by IDIAP would need to be able to withstand the scrutiny of MIDA and IDB officials and would need to place IDIAP clearly within the

framework of IDB's Agricultural Service Modernisation Program and the state reform policy being adopted by the central government.

Finally, market liberalisation and the elimination of trade barriers (as part of WTO rules and FTAA negotiations) imposed new exigencies on agricultural producers as well as on research and extension services. The prevailing supply-driven, disciplinary model of research was no longer appropriate for the accomplishment of IDIAP's mandate. In 1994, IDIAP's objectives were: (i) *"to increase the supply of technological innovations so that producers have various production alternatives; (ii) to increase economic and productive efficiency, such that the desired levels of sustainability are guaranteed; and (iii) to promote the industrialisation of the sector*" (IDIAP, 1995:3). The research agenda was short- and medium-term oriented, and broad as a result of the constant addition of new crops and issues without a formal process for prioritisation.

In terms of the internal environment for institutional change, IDIAP, as did many other public organisations in Panama at that time, faced a high degree of polarisation among its staff members. The political crisis at the end of the 1980s, the USA invasion and subsequent reorganisation of the state created the conditions for this polarisation. In fact, the General Director, who assumed the leadership of IDIAP in 1994 and his close collaborators, were dropped out of IDIAP in January 1990, days after the USA invasion. With the new democratically elected government, many former researchers were re-recruited. This meant that the change initiative had to gain confidence and legitimacy within IDIAP's civil servants and to reunify them.

With these motivations in mind, IDIAP's leading management launched the institutional change initiative in November 1994. The objectives of the initiative were defined as: (i) to change the institutional mode of intervention; and (ii) to strengthen the technical base of Panamanian agriculture. Four initial guiding principles were defined:

- The process has to be **participatory.**
- **Synergism** among people and organisations has to be promoted.
- **Deconcentration** of resources will be implemented.
- **Decentralisation** of decision-making processes will be reinforced.

Two main strategies were formulated to consolidate the initiative:

1. To incorporate the change initiative as part of the component of modernisation of agricultural research and extension within the MIDA-IDB Modernisation Program, which was in its formulation phase, would provide the funding for the change process.
2. To become a "*pilot case*" of the ISNAR PM&E project, which was starting its second phase focusing on the institutionalisation of an integrated PM&E system in agricultural S&T organisations, would provide technical support for strategic planning and the design and institutionalisation of IDIAP's PM&E system.

In December 1994, D. Horton, the manager of the ISNAR PM&E project, visited IDIAP for initial talks for an IDIAP-ISNAR collaboration. In January 1995, one of the project's PM&E experts (Dr Rafael Posada) carried out a short-term consultancy for the incorporation of the PM&E strengthening sub-component into the component of modernisation of agricultural research and extension of the MIDA-IDB Modernisation Program. Later, in February 1995, IDIAP's director of planning participated in the PM&E planning workshop in Quito. Finally, in

August 1995 IDIAP and ISNAR signed a '*letter of agreement'* for collaboration in the institutionalisation of an integrated PM&E system in IDIAP.

The agreement with the ISNAR PM&E project, the inclusion of the initiative into the MIDA-IDB Modernisation Program, and the establishment of the organisational change structure allowed the change initiative to be transformed into a process of institutional change.

5.4.1.1 Theoretical and methodological perspectives of the ISNAR PM&E project

Some key guiding premises of IDIAP's process of change were inspired by the theoretical and methodological references of the strategic management of organisational change developed by the ISNAR PM&E project during its first phase (1991-1995)[27]. The principal features of the strategic management were:

- the guiding hypothesis that the "*rise and fall of R&D organisations is strongly associated with the rise and fall of the national development model*" (Gálvez *et al*., 1995).
- The concept of organisational sustainability as the joint effect of three essential components, as expressed in the Triangle of Organisational Sustainability (see Figure 5.2). The three interrelated dimensions are: an organisational project (mainly a strategic plan), the organisational competence to carry out that strategic plan and the credibility reached from its interaction with the external operational context.

Figure 5.2 The triangle of organisational sustainability (Gálvez *et al*., 1995)

- The development of strategies as a key feature of the change process; strategy is conceptualised as the logical combination of action, factor and actors to achieve a goal or long-term vision.
- The key role of top managers of organisations in change processes. The strategic intention consists of the ideal combination of the following elements: a futurist view of organisation; the conviction that it is important to have a strategic plan that can turn this vision into a reality; a strong desire that this strategic plan will succeed; the political will to make viable the formulation and implementation of the plan; and the courage to assume the risk underlying an initiative of this type and magnitude.
- The context-centred approach for the SWOT analysis focuses on the market and the demands of clients, users and partners. Methodologically, this means: to start identifying the

[27] The ISNAR PM&E project is described and analysed in depth in chapter 7.

opportunities and threats in the context and then proceed with the internal organisational analysis to identify strengths and weaknesses with regard to already identified opportunities and threats;

- The long-term commitment of change process.
- Building a strategic culture, meaning the institutionalisation of strategic thinking, to achieve a flexible organisational behaviour that adjusts to changing conditions.
- Employing a holistic inter-disciplinary approach to explore the complexities of reality (*ibid*.).

These references came to IDIAP's process of change in different ways, but mainly through: (i) participation of IDIAP's professionals in regional workshops of the PM&E project, such as in Ibarra in 1993, Turrialba in 1994, and in Quito in 1995; (ii) individual access to project publications; and (iii) the realisation of national workshops designed to socialise IDIAP staff to the project references.

5.4.2 Institutional change process

The main characteristic of the change process and its results are presented in the next sections.

5.4.2.1 Organisational configuration for institutional change

The 'structure' for change was very similar to the formal hierarchical organisational structure (see Figure 5.3). IDIAP's organisational change 'structure' was integrated by groups of technical and political management, both at national and regional levels. Contrary to the formal one that acted under the principle of argument of authority, the change 'structure' emphasised the principle of authority of arguments through negotiated participation.

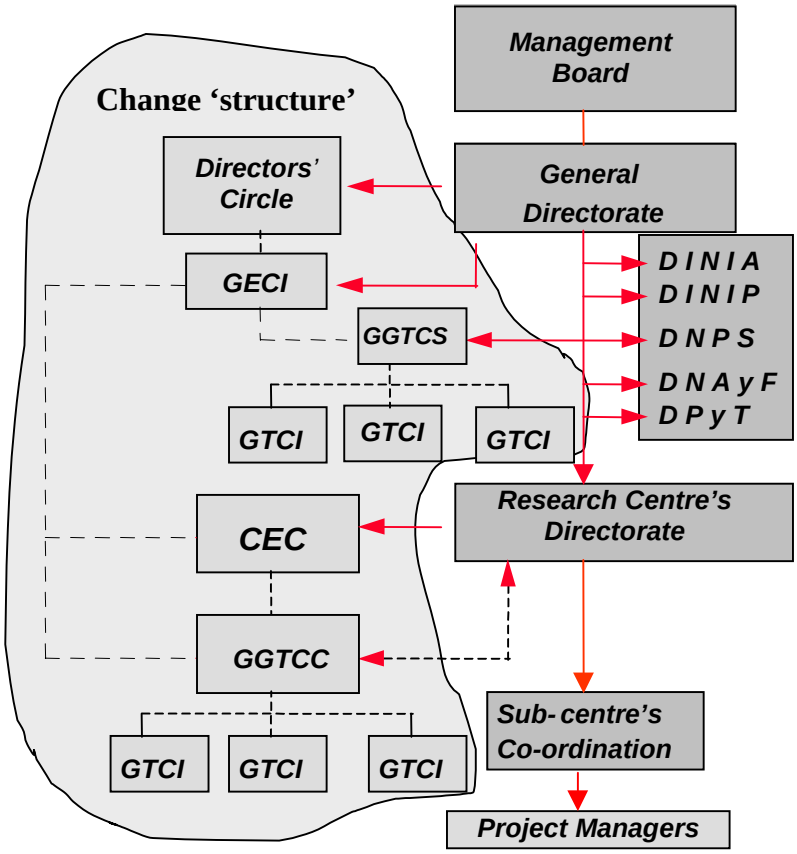


Figure 5.3 Organisational change 'structure' (based on Santamaria & Sarmiento, 1997)

As a first step in the establishment of this 'structure', the Strategic Group for Institutional Change (GECI) was created, which acted at the national level and responded directly to the General Director.

All activities during the process of change were co-ordinated by the GECI, which had the political support of the Director's Circle (consisting by the General Director, the Deputy Director, the National Directors and the Research Centre's Directors), in which the main political decisions about the change were discussed and sanctioned.

At the same time, the Centre's Groups for the Technical Management of Change (GGTCC) and the Headquarter Group for the Technical Management of Change (GGTCS) were created. The Centre's Executive Committee (CEC) which integrated the Director of the Research Centre, the project's managers and the chiefs of sub-centres, provided the political support for the process at the regional level. The GGTCC and the GGTCS were installed in a special ceremony with the participation of IDIAP staff, representatives of the producers and regional governmental authorities. In each of the phases of the process, the GGTCC organised the Working Groups for Institutional Change (GTCI) that carried out technical assignments related to the discussion of specific organisational issues and the generation of proposals for change.

These groups began to develop meetings and workshops with staff members for promoting the necessity of institutional change. During the motivational workshops, staff members carried out group-work assignments to agree on the macro-steps and guiding principles of the change process. Finally, a national workshop to formulate the action plan for IDIAP's change was held.

The macro-steps that were considered necessary for institutional change were:

1. "*to define the long term orientation (future vision, mission, and objectives);*
2. *to design the new organisational mode of intervention (R&D model, strategies and policies);*
3. *to design and implement the integrated PM&E system;*
4. *to design and implement a system for promoting and developing the organisation's human talents;*
5. *review the organisation's legal framework;*
6. *to institutionalise change culture; and*
7. *to carry out continuous improvement*" (Santamaría, 1997:9)

In addition to the four previously established guiding principles for institutional change, another three principles were defined: ***Recognition and valuing of human talents***, ***negotiation,*** and **communication & information**. In all, the principles were:

- "*participation;*
- *recognition and valuing of the organisational human talents;*
- *decentralisation;*
- *deconcentration;*
- *synergism;*
- *negotiation as the basis of agreement and management of conflicts and resistances; and*
- *communication & information of the process to internal and external operational contexts"* (*ibid.).*

Thus, the institutional change process was framed in a very rational way. It looked like a special 'strategic project' that had its management team (the GECI), an action plan, assigned resources and time schedule. But, the great difference was its participatory character. In the next section, the internal and external participation during the process of change is presented.

5.4.2.2 Internal and external participation

From its very beginnings, IDIAP's process of change included the collective analysis of its external and internal organisational environment. This implied an articulated analysis of the changing context (global, regional and national), taking in consideration the critical factors and the future trends and implications for Panamanian agriculture. To gain the confidence of the civil employees and to give legitimacy and consistency to the change process and its proposals, it was decided to develop the internal and external organisational analysis in a participatory way. Therefore, IDIAP's staff, organised in GTCI, actively participated in the activities of change process. For the situational (SWOT) analysis:

- They first identified the critical external factors for the future of agricultural research in Panama. These critical factors identified by the GTCI were consolidated at the level of research centres and then presented and discussed in a national workshop with representatives of all research centres. A total of 115 critical factors were identified by the GTCI during this exercise. In the national workshop, the groups of technical management of change agreed on 15 critical factors for agricultural research.

  The following critical factors for agricultural research were collectively identified during the situational analysis:

  - *structural heterogeneity of the agricultural sector;*
  - *global climate changes and protection of the environment and natural resources;*
  - *new actors in agricultural research and technology transfer activities;*
  - *diversity of sources and forms of financing of agricultural research;*
  - *regional, sub-regional and national technological integration programs;*
  - *rise of biological and sustainability paradigms and decline of chemical one;*
  - *decrease and elimination of tariffs and subsidies to agri-alimentary products;*
  - *partnership of public and private sectors in agricultural research;*
  - *rise of the Knowledge and Information Society;*
  - *privatisation of support services to agricultural production;*
  - *maintenance of neo-liberal model of economic development;*
  - *change of the role of public agricultural organisations;*
  - *new legal frame for agricultural research; and*
  - *modification of habits of consumption;*
  - *rise of agro-industrialisation* (*ibid*.:5).

These 15 critical factors constituted the initial basis for the identification of threats and opportunities for IDIAP.

- Second, using the identified threats and opportunities as a reference point, the GTCI performed the internal organisational analysis to identify the organisational strengths and weaknesses at the level of the Centres. The results of the SWOT analysis were finally consolidated in a National Workshop that also included the participation of representatives of partner public research and extension organisations as well as representatives of producer organisations.

This analysis allowed IDIAP simultaneously to identify the 'real situation' it faced, and provided many learning experiences to its staff. In addition, it allowed for the development of contextual awareness and an institutional capacity for teamwork.

During the self-assessment workshops in 1998, among the impacts reported in the motivational dimension, it was highlighted that: "*management became more committed to institutional change and gained greater respect for the skills and abilities of staff. Staff became more motivated and committed to the institution. The level of uncertainty within IDIAP was reduced, resulting from a demonstrated ability to deal with external pressures and to manage change*" (IDIAP, 1999a:19).

Concerning organisational capacity, it was recognised that IDIAP: *"had enhanced its knowledge and skills in the areas of PM&E and management of organisational change. Additional changes in capacity included improved teamwork and improved project management, throughout the decentralisation of financial resources at the level of projects*" (*ibid.*).

According to the perception of participants, IDIAP's stakeholders became more favourably disposed towards the organisation, largely as a result of their involvement in the change processes and in R&D activities of the organisation. Among others the following changes in the relationship were highlighted:

- *more extensive and improved relations with other organisations;*
- *enhanced relevance and pertinence of research activities;*
- *greater participation of external stakeholders in the organisation's change process;*
- *greater participation of producers in the research and development activities of the organisation;*
- *greater demands from public and private entities for information and training in PM&E and management of organisational change;*
- *fortification of the strategic alliances with public and private institutions at national and international level; and*
- *greater capacity to contribute to the definition of sectoral policies (ibid.:20).*

The changes implemented that affected the institutional dimension of IDIAP are presented in the next section.

5.4.2.3 Changes in the institutional dimension

At the end of 1997, the first three macro-steps (outlined in section 5.4.2.1) were accomplished. The results of the SWOT analysis served as the basis for defining the long-term orientation of IDIAP, the major elements of the research model and mode of intervention, as they were defined in the Strategic Plan (the institutional mission, objectives, policies, strategies and research programs). Additionally, the integrated PM&E system was formulated, translating the institutional strategic definitions into operational norms, regulations and procedures.

It is important to stress here that never before, since it creation in 1975, had the IDIAP discussed and collectively agreed on its future vision. During the USAID's strengthening program, the IDIAP's logotype was changed and its motto was defined as: "*the first link in the agricultural production chain*". As a result of the institutional change process, the IDIAP new motto became: "*agricultural research for the present, looking to the future*", and IDIAP's future vision now

states: "*IDIAP is committed to the small- and medium-sized producers and agribusiness*[28]*, in tune with their necessities and demands and recognised as the most important agricultural research institution in Panama*" (IDIAP, 1997a:25).

Furthermore, the discussion and the participatory definition of the main elements of IDIAP's identity during its institutional change process allowed the transformation of its mode of intervention. Indeed, IDIAP's mission as formulated in 1997 reflects a broader mandate and organisational promise as well as societal commitment. The mission is now based on three core principles: equity, competitiveness and sustainability and states that IDIAP will make its contribution: "*to strengthen the national agricultural-technological base to contribute to food security, competitiveness of agribusiness and the sustainability of agriculture, to benefit Panamanian society*" (*ibid*.).

The mission statement was complemented with the redefinition of the organisation's objectives that were: a) "*to improve qualitatively the process of generation and transfer of technology, b) to generate and transfer technologies for the food security, agro-industry and exports, and c) to improve qualitatively the management and administration of the generation and transfer of technology*" (*ibid*.:26).

IDIAP, in correspondence with the national objectives of development, defined two fundamental axes of generation and transfer of technology:

- *to strengthen the technical base for food security of the population in crops and systems of strategic importance for internal consumption;*

- *to strengthen the technical base for the competitiveness of agricultural business in crops and systems oriented to agro-industry and the external market* (*ibid.*: 27).

With these premises, IDIAP replaced its research model that traditionally was based on the internal capacity to supply technology, by one in which the research is oriented to attend present and future demands of its stakeholders in national agro-production chains (see Figure 5.4).

According to the new research model, "*the process of generation and transference of agro-technology is organised on the basis of research projects carried out by an interdisciplinary team of researchers and oriented by the integrated crops/systems management approach. The research projects are located in specific agro-ecological zones to produce technologies that will be technically solid, economically feasible, socially desirable and environmentally safe and stable, to respond to the demands of stakeholders of the agro-production chains*" (*ibid.*:27).

[28] According to IDIAP, agribusiness is understood as: *"a set of components and the operations of production, processing, distribution and trading of agricultural and agroforestry inputs and products made up of interrelated productive chains, including support services*" (IDIAP, 1997a:25).

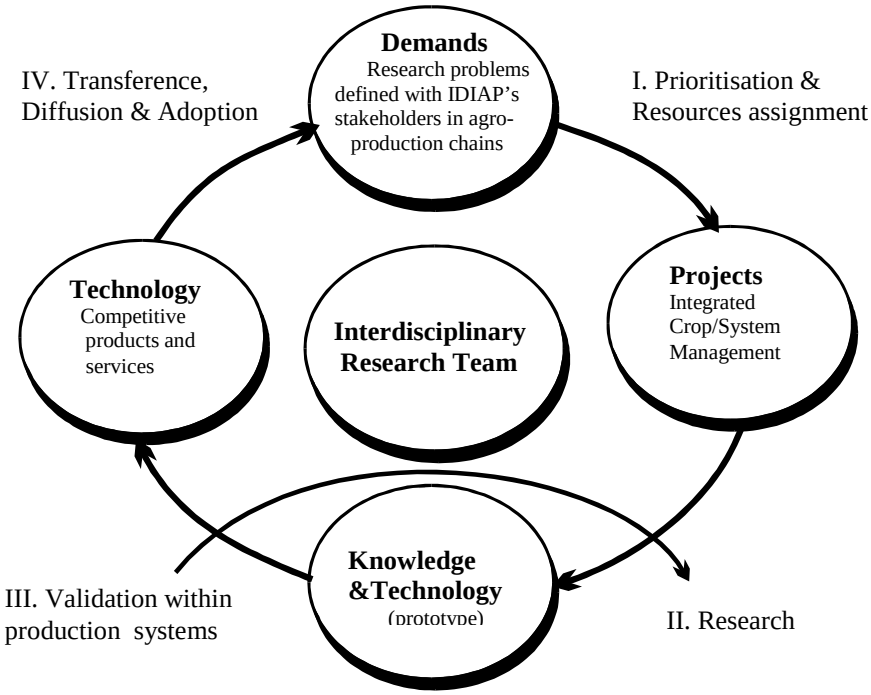


Figure 5.4 IDIAP's research & development model (IDIAP, 1997b)

The new model represented a significant shift in focus from research activities per se towards research and development (R&D) projects. Still, the model of research remains linear and based on the TOT model of innovation.

In addition, three national research programs were created:

- ***R&D for small farmers' production systems****:* mainly oriented to technology adaptation for small farmers, indigenous communities and marginalised *campesinos;*
- ***R&D for commercial production systems****:* mainly focused on applied research for commercial agriculture oriented for both the internal and external market; and
- ***R&D for genetic resources and biodiversity management****:* focusing on basic and strategic research to generate technologies for sustainable agriculture and rural resources management (*ibid*.).

On the basis of consensus of the opinions of the different group involved in the process of institutional change, a series of organisational policies and strategies were considered, to favour the accomplishment of institutional objectives. In this sense the following policies and strategies were considered:

- "*qualification of organisation's human talents in new areas and subjects of research, such as molecular biology, genetic engineering, biological control of plagues and diseases, agroforestry, management of genetic resources and biodiversity, economics of natural resources, management of science and technology;*
- *implementation of an integrated PM&E system under the strategic approach;*
- *stimulus to creativity, excellence and improvements in the quality of organisational processes;*

- *promotion of strategic alliances with national and international R&D organisations; and*
- *management of competitive projects of R&D under the interdisciplinary systems thinking approach*" (*ibid*:28).

The major elements of the new IDIAP R&D model, in contrast with the previous one (see Box 5.1) are presented in Box 5.2.

Box 5.2 **Major elements of IDIAP's research model (1995 - 1998)**

Research paradigm:
- eco-centric research paradigm; emphasis on finding the optimum solution for integrated Crop and System management.

Demand-driven model of technology development:
- problem defined with the 'participation' of IDIAP stakeholders;
- research process designed within an inter-disciplinary team;
- collaborative R&D project with Universities and IARCs are negotiated based on IDIAP mission and priorities.

Context centred
- research programs organised around relevant actors and issues;
- problems emerging out of agro-production and natural systems;
- problem emerging out of integrated crop/system management approach.

Communication:
- linear transmission of information from the researcher to extension agents and farmers;
- participation of potential beneficiaries through "*consultas*";
- participation of extension agents through technical meetings.

Financing:
- Dependent on the government budget, national and regional competitive funds and research contracts.

Source: this research.

The logic behind the institutional change process of IDIAP was that the change of research model would lead to changes in the organisational model of intervention. If the approach to research projects were to change so that they became interdisciplinary, multidimensional, inter-organisational and context-oriented, then IDIAP would have to change deeply to be able to practise this new approach. This means that individual and organisational way of thinking and acting would also have to change to formulate and manage the new conceived type of projects (IDIAP, 1998:2). Therefore, IDIAP started to implement some organisational changes in this direction. These changes are presented in the next section.

5.4.2.4 Changes in the organisational dimension

Based on a series of criteria for the creation of research centres discussed with the GGTCC and after consultation with the representative of stakeholders, it was decided to organise IDIAP into seven agro-ecological and thematic research centres (instead of five research centres that then existed. Two new research centres were thus created: the Genetics Resources Research Centre and the Humid Tropical Research Centre. The creation of these two new centres was based on the analysis of external critical factors for agricultural research, specifically regarding the rise of biological and sustainability paradigms and the increase of environmental awareness. Additionally, the newly created research centres were focused on activities related to the research program on the management of genetic resources and biodiversity.

In 1997, IDIAP started to implement an integrated PM&E system under the strategic thinking approach. This integrated PM&E system is the instrument used by the organisational

management to provide the organisation with the organisational flexibility needed to respond to the changes in its operational context. The system included the "*mechanisms of external articulation*" that considers the participation of IDIAP's stakeholders, and the "*mechanisms of internal articulation*" that will allow the effective operationalisation of research and transfer processes at different management levels. Its implementation tried to simplify the organisational operation, diffusing the management of research resources, and decentralising decision-making processes (*ibid*.).

Within IDIAP's integrated PM&E system, the R&D project has been defined as the basic unit for the planning, programming, execution and administration of agricultural research. Starting in 1997, the resources for agricultural research were decentralised to research centres to be managed by the project's managers. The decentralisation consisted in effectively transferring financial resources to the project managers according to a previously approved budget.

The distribution of financial and physical resources to the projects followed a prioritisation process carried out with external participation. Among the requisites for submitting project proposals to a selection committee was their ratification by the producers who were to benefit from the research. The ratification by producers was to be obtained through the realisation of consultation to define the research problem and by establishing different forms of agreement to attend specific demands for agricultural technology. In 1997, 54.3% of the investment budget corresponding to 751,900.00 *balboas*, were decentralised; Respectively 48% and 49.6% of the investment Budget were decentralised in 1998 and 1999 (see Table 5.1).

Table 5.1 Execution of research activities in IDIAP (1996 - 1999)

Year	Executed Activities	Variation %	Investment B/.	Variation %	Investment by activity
1996	403		968,578		2403.42
1997	323	-5.2	859,123	-11.3	2659.82
1998	385	+19.2	1,131,396	+31.7	2938.69
1999	469	+21.8	1,300,000	+14.9	2771.85

Source: IDIAP, 1997c, 1998, 1999b, 2000b and 2001.

The reorganisation of agricultural research and the involvement of a greater number of stakeholders in setting the research agenda allowed an important increase of research investment in 1997 (31.7%) and 1998 (14.9%) (see Table 5.1). In 1996, 403 activities were executed grouped in 28 projects. Before their prioritisation, research activities were programmed independent of the availability of funds. With their prioritisation, the projects were ranked according to their contribution to the organisational mission and goals. Then, the budget funds were distributed among these projects. This process allowed for the execution of 25 project and 323 research activities in 1997. Contrary to the previous situation, in which all research activities programmed by researchers were included in the investment plan, research activities of research projects that following prioritisation received funds were included. This explains the diminution of the number of research activities in 1997.

As stated above, the process of institutional change was one pilot case of the ISNAR PM&E project. The systematic exchange of experiences among professionals participating in the change process of different countries and R&D organisations allowed for the collective construction and appropriation of knowledge about institutional change. In the next sections the theoretical and methodological isuses developed during the change process, in collaboration with other pilot cases, are presented.

5.4.3 Theoretical and methodological issues developed during the change process

Collaborating with other professionals within the ISNAR PM&E project in one of its pilot cases, IDIAP professionals developed conceptual and methodological issues, for the strategic management of institutional change. Through the process of collective construction and appropriation of knowledge[29] including *exchange, reflection, conceptualisation, and operationalisation* at the regional level, followed by *application* and *reconfiguration* during IDIAP's process of change, the following theoretical and methodological issues were developed:

- the understanding of institutional change as a complex multidimensional process (Diaz *et al*., 1997);
- typology of organisational change depending on the momentum of the initiative and the depth of implemented changes (*ibid.*);
- the strategic management of institutional change, in which the participatory processes are as important as the results, and including the political and technical management dimensions (*ibid.*);
- a guiding methodology for self-assessment (evaluation) of institutional change processes (IDIAP, 1999a; Mato *et al*., 2000);
- a guiding framework for designing and implementing an Integrated PM&E System (Granger *et al*., 1997);
- methodological guidelines for managing of "Competitive Projects" (Aued *et al*., 1997); and
- a guiding methodology for designing and implementing of Management Information Systems in R&D organisations (Bolivar *et al*., 1997);.

The impact of these issues on R&D organisations was evaluated by Siri & Borges-Andrade during 1998-1999 and published by ISNAR as part of the series: Evaluating Capacity Development in Planning Monitoring and Evaluation[30].

On the basis of quantitative and qualitative data, Siri and Borges-Andrade concluded that: "*the greatest magnitude of impact as a result of exposure to project publications has occurred in the motivation and capacity of both individuals and organisations. This implies that the Project publications effectively provided the means by which many individuals and organisations in the LAC region and beyond have been empowered to develop favourable attitudes, as well as key knowledge and skills which enable them to change for the better*" (Siri & Borges-Andrade, 2000:29).

Considering that pilot case professionals were involved in the production of these theoretical and methodological issues the impact is even more significant for them. Indeed, regarding the impact on pilot case organisations, Siri & Borges–Andrade reported that: *"respondents from Pilot Case countries, (Costa Rica, Cuba, Venezuela and Panama), indicate that a very high impact has been achieved on the motivation and capacity of their agricultural research organisations. A very substantial impact as the result of Project publications is also reported in their performance* (*ibid.*).

Moreover, in self-assessments made in 1998, participants drew lessons from IDIAP's change process. Furthermore, a consolidated list of results, factors and general lessons were drawn during the synthesis exercise with representatives of other pilot cases within the PM&E project.

[29] This framework for knowledge generation and appropriation is presented in chapter 7 (section 7.4.2)
[30] See also Horton *et al*., 2000.

Finally, a summary report about changes in pilot cases was published by ISNAR as part of the above-mentioned series (e.g., Mato *et al*., 2000, and Horton *et al*., 2000).

The general lessons drawn from the PM&E pilot cases' self-assessments on the change process are also considered a valuable reference for other initiatives of institutional change. The most important are found below.

- *Political and technical leadership are both indispensable for a successful process of institutional change.*
- *At the outset of a change process, it is essential to establish guiding principles and operating procedures and to develop an overall plan for the process.;*
- *A technical body should be established that is responsible for managing the organisational change process. Ideally, the members serve on a full-time basis.*
- *Broad participation and teamwork are vital for planning and implementing successful organisational change processes.*
- *Continuous communication on the change process, its goals, methods, and progress is essential to maintain commitment of staff and key external stakeholders.*
- *Implementation of agreed changes is essential to maintain credibility.*
- *Capacity to monitor and respond adequately to changes in the environment needs to be developed, in order to ensure institutional sustainability* (Mato *et al*., 2000).

In September 1999, the national government changed in Panama, as did most of the high- and middle-level managers in IDIAP. The new IDIAP administration decided not to implement some proposals, which were formulated during the process of change. Moreover, some of the implemented transformations were reverted to the previous situation. The changes implemented in IDIAP during the last three years are presented in the next section.

5.5 Science-driven IDIAP (1999 - 2002)

The most important change in the management of agricultural research was the strengthening of the role of science in the definition of its research agenda and priorities. As was stated in the medium-term R&D plan for the period 2000- 2004*, "agricultural research must provide systemic and interdisciplinary solutions, that can spread and expand the advances derived from the application of modern science to agriculture and elevate its efficiency and effectiveness* (IDIAP, 2000c:8).

5.5.1 Changes related to institutional dimensions

During the previous administration the emphasis was on generating technologies that contributed to increase the competitiveness of agriculture mainly by increasing productivity and reducing the costs. In contrast, the R&D plan for 2000-2004 emphasises the strengthening of internal capacity of scientific knowledge generation and to use it to "*to discover new applications*". Therefore, the research activities are oriented mainly towards the *"increase of the amount of agricultural and forest knowledge from the perspective of the applied scientific research*". Its immediate purpose is the constant generation of new technologies; that is, of "*ordered bodies of knowledge that include methods and techniques scientifically developed, reproducible and efficient*" (*ibid.*: 38).

The shift from a demand-driven to a science-driven management of agricultural research implied the abandonment of strategic management that focused on a greater relevance of research to needs and opportunities in the productive sector. Therefore, the new policies and strategies are oriented to improve internal capacity for supplying efficient technologies and to ensure *"the integration, sustainability and relevance, in the scientific work*".

With the medium-term plan, the new administration aims to: "*effectively contribute to the economic and social development of the country, by means of a re-oriented and ordered national system of scientific research and agricultural technological development*" (*ibid.*:31).

The general objective of the R&D plan is: *"to order and to optimise the real contribution of R&D activities of IDIAP, to the productive agricultural activities attending their necessities, increasing its competitiveness and productivity, to reach better levels of well-being for the rural population and to overcome rural poverty and social and economic underdevelopment*".

And more specifically:

- "*to increase the quality (compared to international standards) and relevance of agricultural R&D, validation, transfer and diffusion of technologies;*
- *to fortify the scientific and technological capacity of organisational units, with regard to infrastructure, human resources, administrative support, organisational management tools and policies;*
- *to re-orient the actions of technological R&D of IDIAP, towards a systemic approach, based on production systems, according to agri-food and agro-industrial technological demands and including the consideration of sustainability and agro-ecological awareness, in each program and project;*
- *to tie the work of IDIAP, in effective and permanent form, to the different actors of the governmental, academic and productive agricultural sector; by means of diverse forms of relations and interactions, both traditional and innovative; and*
- *to promote, by means of modernisation, a real integration of the different types of rural economies into the national productive process*" (*ibid.*:32).

According to the new orientation of agricultural research management, the axes of the organisational action will reside in "*multidisciplinary programs"*, in which, the implementation of policies is oriented towards higher levels of "*scientific productivity"*[31] and the "*rationalisation"* of organisational processes and resources. As is stated in the R&D plan, special attention will be paid to: "*update the infrastructure and equipment, including re-engineering and modernisation of laboratories*" (*ibid.*:34).

Specifically, the following policies and strategies were formulated in the R&D plan:

- *renovation of the organisational cognitive base;*
- *permanent evaluation of research activities and its concrete results;*
- *decentralisation and de-bureaucratisation of research administration;*
- *a proactive search for resources and investments;*
- *prioritisation of a systemic approach, to guarantee effectiveness;*
- *agro-ecological awareness in each program and project;*
- *emphasis on strategic alliances with universities and producer associations;*
- *broadening the use of Information Systems technologies* (*ibid.*:36)

[31] Research Productivity based on the premise of *Publish or perish*!: *"measured by the number of published scientific and technical articles in specialised journals, the number of research projects generated and executed, the amount of research subsidies obtained, the number of patents and products generated, and prepared and published books"* (IDIAP, 2000d:11).

In accordance with the emphasis on the improvement of scientific productivity, some of the implemented changes during 1995 - 1998 were reverted to the previous situation. This is the case of research programs that were reverted to the former crop and product's disciplinary classification (i.e., basic grains; Fruit-growing; Horticulture; Roots and tubers; Non-traditional cultures; Forestry and silviculture species; Beef cattle; Dairy cattle; Smaller species; Aquaculture).

The case of economic research is an illustrative example of the new orientation of research. Instead of being part of an interdisciplinary research project, economic research activities now belong to a newly created socio-economic research program. This program includes research activities oriented to: economic evaluation of experimental results, analyses of agricultural economic policy, characterisation of production systems, research on adoption of technology, research on the economy of agricultural enterprises, and developing methodologies for socio-economic research.

In addition, the context is perceived as complex but manageable for applying scientific knowledge. Therefore, "*only the sustainable handling of resources that provides the scientific and technological development can lead to developing institutional policies, strategies of conservation and knowledge systems, based on the proper understanding of the relationship between agricultural necessities and caring for biodiversity*" (*ibid.*:27).

The major elements of IDIAP's research model implemented since 1999 are presented in Box 5.3.

Box 5.3 **Major elements of IDIAP's research model (1999 - 2002)**

Research paradigm:

- techno-centric scientific research paradigm oriented to "*systematic and creative work aimed to increase the volume of knowledge and to use this knowledge to discover new applications".*

Science-driven model of technology development:

- problem defined by senior agricultural researcher;
- research process designed by senior agricultural researcher; and
- collaborative R&D project with Universities and IARCs are negotiated based on its scientific relevance.

Multidisciplinary, science centred:

- research programs organised around disciplines and 'modern sciences';
- problems emerge out of research programs and market signals; and
- problem emerge out of multidisciplinary approach of researchers and their scientific capacity to establish cause-effect relationship.

Communication:

- diffusion of information mainly 'tech-pack', through marketing strategies;
- participation of producer in validation and demonstration plots; and
- participation of extension agents trough technical meeting.

Financing:

- dependent on the government budget and research contracts;
- governmental NGO (FIAFOR).

Source: this research.

5.5.2 Changes in organisational dimension

With regard to the organisational structure, the directorate in charge of activities of technology transfer was replaced by the directorate of *Products and Services*. This directorate is in charge of the marketing of generated technology and the promotion of scientific services offered by IDIAP**.**

In addition, the management of financial resources was reverted to the central administrations as well as the physical resources like transport, which were centralised in the research centre's administration.

In 2000, IDIAP created the Foundation for Agricultural and Forestry Research (FIAFOR) as a not-for-profit organisation aimed to 'support' research activities through accessing non-conventional sources of funding. In 2001, the research projects administered by FIAFOR represented 40% of the activities carried out by IDIAP (IDIAP, 2002a).

In practice, however, the creation of FIAFOR attempted to avoid governmental supervision and control and to gain access to the newly created *competitive funds for agricultural research*. The research projects are formulated by IDIAP researchers as part of their functions and submitted by IDIAP to the funding source. Once approved, FIAFOR assumes the administration of funds, and receives a commission (overhead), representing between 15 and 25% of the total amount of the project budget. Nevertheless, IDIAP's technical personnel execute the projects and in some places have partial or totally substituted the former research projects. Actually, some producers see this situation as a kind of semi-privatisation of IDIAP.

The participation of IDIAP staff in the design of the above-described change is discussed in the next section.

5.5.3 Internal and external participation

The current IDIAP administration uses the formal hierarchical structure for designing and implementing the "adjustments" that are taking place. Concerning research activities, for example, "*one advisor of the General Director, coming from a private university, formulated the R&D plan and other basic documents. The plan was presented and approved in a meeting with national and regional directors. The new orientation was then communicated to the rest of the technical staff and began to be implemented*" (Interviewee I, this research).

As part of this research, I conducted a series of semi-structured interviews during 2000 and 2001 with IDIAP's managers. The aim of these interviews was to assess their perceptions about the role of R&D organisations and their innovation process. From these interviews with IDIAP's regional and national directors, the following statements were highlighted:

Concerning the research paradigm:

- *"Our mandate is to generate technology and deliver it to the extension agent;*
- *We shall keep the generation, transfer and extension of agricultural technology separate.*
- *Research projects will continue to be discipline-specific; interdisciplinarity is an ideal that does not work.*
- *The role of IDIAP is only to deliver the technology.*
- *Organic agriculture is not the solution because it is very complex.*
- *We need to work within the whole system of science and technology.*
- *We are adopting the demand-model of technology development.*
- *Modern science is expensive, interdisciplinary and inter-organisational.*

Concerning social worldviews:

- *The market is the driving force of agricultural innovation.*
- *Our organisation is like a system, formed by interconnected components.*

- *The formulation of an organisational vision and mission depends on the identification of market opportunities.*
- *We have to investigate crops and products that are (or have the potential to be) competitive.*
- *In agriculture, one must make decisions based on the market's signals.*
- *We are working against time, because of the elimination of taxes and barriers;*
- *We need a long-term vision of agricultural development;*
- *Diversity and complexity are now the rules of the game" (*Different interviewees, this research).

After three years (October, 2002), IDIAP held a national workshop on: "*Methodological approaches for strategic planning of agricultural research in IDIAP*". More than 100 staff members (researchers, project managers, Centre and National Directors) participated in this workshop. After the presentation on results of the institutional change process (1995-1998), participants were divided into nine groups to discuss: (i) whether the institutional change process should continue or be re-activated; (ii) if so, what are the macro-steps that should be accomplished; and (iii) what are the immediate actions that should be taken? The results of the group discussions were presented for debate in a plenary session and summarised in a report sent to the General Director. From this report, the following results deserve particular attention:

- All nine groups agreed on the convenience of re-activating the process of institutional change which had been stopped in 1999. Additionally, five groups requested the "*institutionalisation of change process*" and four groups suggested the need for the "*recognition and valuing of organisational human talents*".

The following Macro-steps were proposed for reactivating the process of change:

- *implementation of the Strategic Plan formulated in 1997 (6 groups);*
- *implementation of the integrated PM&E system (1997) (2 groups);*
- *modification of the law that created IDIAP (2 groups); and*
- *formulation of strategic plans of research centres (1 group).*

With regard to the immediate action for re-activating the process of change, the groups proposed:

- *reactivation of the technical management groups - GECI and GGTCC (6 groups);*
- *internal sensitisation and 'capacitation' about the change process (6 groups);*
- *promotion of IDIAP within the context, establishing strategic alliances with producers and partners (6 groups);*
- *reviewing the current research projects and programs for consistency with the Strategic Plan formulated in 1997 (five groups);*
- *decentralisation and deconcentration of resources for research and transfer of technology (1 group)* (IDIAP, 2002b).

To date there has been no intention to reactivate the process of change as proposed by the majority of IDIAP technical personnel. Unfortunately, this personal management model is not the exception in public R&D organisations in LAC. As one of interviewees said, "*now we have to wait until September 2005, when the new government administration will hopefully do something different*" (Interviewee 20, this research).

External participation is implemented through consultations with producers to identify priorities and opportunities for agricultural research. Then, using the information gathered from producers and extension agents, the researcher *"elaborates the problem tree*" and designs the research activities. Mainly medium-sized and highly capitalised producers participated. As one of the regional director stated, "*small producers do not receive benefits from agricultural research, and IDIAP by law has the responsibility to increase their technical knowledge*" (Interviewee 24, this research).

5.6 Praxeology of institutional innovation in IDIAP

On the basis of information presented in this chapter, the main elements of IDIAP theories of action for institutional innovation are summarised and compared in the next section.

5.6.1 Comparative analysis of IDIAP theories of action for institutional innovation

In the next matrix (Table 5.2), changes in dimensions of theory of action for institutional innovation are analysed between periods (horizontal comparison) and their consistency within a given period (internal consistency).

Table 5.2 Dimension of theories of action shaping IDIAP changes.

	Supply-driven (1975 - 1994)	**Demand-driven** (1995 - 1998)	**Science-driven** (1999 - 2002)
Rationality	Instrumental	Strategic	Instrumental
Research paradigm	Techno-centric scientific	Eco-centric, hard systems thinking	Eco-centric, hard systems thinking
Social worldview and image of organisation	Mechanistic Provider of technical solutions	Economic Production system (change agent)	Mechanistic Laboratory, provider of scientific information and technology
Cultural worldview	Hierarchy	Hierarchy (Egalitarianism)*	Hierarchy (Individualism)*
Conducive policy framework	Import substitution, Structural adjustment policies	Reform of state, Capitalistic globalisation, agricultural treadmill	Reform of state, Capitalistic globalisation, agricultural treadmill
Driving forces of institutional change	Agro-technical change, international co-operation	Market, competitiveness, organisational sustainability	Science, efficiency of research, scientific productivity
Perception of the context	Stable, more or less controllable	Uncertain, but offers opportunities (long-term planning based on scenario building reduces uncertainty)	Complex but manageable, applying scientific knowledge.

* There are some elements of 'dominated' worldviews that co-existed with the leading one. The former is shown between brackets.

Changes between periods:

- A major change occurred in the ontological dimension of the research paradigm that shifted from reductionism, that was predominant in 1975 -1994, to a holistic, eco-centric perspective.
- A temporal shift from an instrumental to a strategic rationality characterised the demand-driven.
- A major tension appears to be between the economic and mechanistic social worldviews. This is consistent with the tension between strategic and instrumental rationality.

- Concerning the cultural worldview, it is not surprising that hierarchy, common to bureaucratic organisations dominates all periods.

Internal consistency within periods:

- There is a high level of internal consistency among rationalities, paradigms and worldviews, within each period.
- Some inconsistency is observed between strategic rationality and the presence of elements of egalitarianism during the demand-driven period. In theory, it was expected to find the predominance of individualism that is more consistent with strategic rationality and the economic worldview.

Without a doubt, changes in the context are forcing institutional transformations on IDIAP. The organisation's response to external conditions and forces depends on the way its context is perceived by IDIAP's leadership. This is clear from information presented in Table 5.2, especially with regard to the demand-driven and science-driven periods. The conducive policy framework was the same, but IDIAP response was different. Indeed, it seems to me that the major weakness of the theory of action during 1999-2002 is its lack of correspondence with the context-based changes that have been going on. It looks '*out of focus*' in many senses.

The changes in the dimensions of organisational *praxis*, are summarised in Table 5.3.

Table 5.3 Organisational *praxis* for institutional innovation in IDIAP

Organisational practices	**Supply-driven** (1975 - 1994)	**Demand-oriented** (1995 - 1998)	**Science-driven** (1999 - 2002)
Type of change practised	Incremental, reaction to changes in governmental policies	Transformational, proactive change. Focus on clients, partners and beneficiaries	Incremental changes "*to adjust the organisation to international scientific standards*"
Way of learning about institutional change	Trial and error, experimentation, single-loop learning	Collective learning by doing, mainly single-loop learning	Learning through application of scientific methods, single-loop learning
Facilitation of institutional change	Top-down directives, advice by external consultants	Charismatic technical and political leadership	Top-down directives, advice by senior scientists
Configuration of change	Hierarchical, formal structure	Hierarchical, informal structure	Hierarchical, formal structure
Management model of institutional change	Personal management model based on the argument of authority	Strategic management of institutional change based on the authority of argument	Personal management model based on the argument of authority
Participation of internal and external actors	Non-participation	Active, negotiated participation of internal actors; external participation by consultation	Internal participation by consultation; no external participation
Development of strategies for institutional change	Adaptive instrumental intuitive strategies	Strategic planning approach	Rational, instrumental development of strategies, planning by objectives
Time orientation of changes	Short-term	Long-term commitment	Medium-term

- In the period 1975-1994, there is a clear internal consistency between the dimensions of organisational *praxis* and dimensions of theories of action presented in Table 5.2.
- With regard to the demand-driven period, some practices such as collective learning, active participation of internal actors and management of change under the principle of "*authority of argument*" denotes and inconsistency with the previously registered strategic rationality.
- Concerning the third period (1999-2002), the elements are very consistent and to some extent resemble the ones that prevailed during 1975-1994.

5.7 Conclusions

Returning to the research questions for this chapter, the discussions above illuminate some possible answers.

Research question 1: How does the institutional innovation of IDIAP reflect the contradictions of the change of epoch?

During 1975-1994, there was a clear internal consistency between the dimensions of theory of action and organisational practices. Then, the context changed and IDIAP lost its orientation. I used to say while debating the downsizing argument for organisational change that "whales become beached, not because they are giants, but because they have lost their sense of direction". The IDIAP leadership and membership perceived the need for change, but how to change?, and in what direction?

The observed inconsistencies and tensions among the dimensions of theories of action for institutional change in IDIAP reflect the crisis of perception and interpretation, provoked by the fragmentation of the rules of the game. Moreover, there are other reverse effects in some of the changes implemented that continue to threaten IDIAP's sustainability. For example the creation of FIAFOR instead of contributing to IDIAP's own sustainability clearly increasing its vulnerability by eroding its credibility among stakeholders.

In addition, it is impossible to overcome complex problems such as poverty, environmental degradation and organisational vulnerability with the same worldviews, paradigms, rationality and mode of interpretation that have created them. That is, the changes in IDIAP, especially over the last three years, are emphasising the a mechanistic, instrumental theory of action on innovation, grounded on mainstream realist positivistic sciences, which are contributing to greater rather than less vulnerability.

Research question 2: What are the theories of action that informed the institutional innovation of IDIAP?
On the basis of internal consistency and the comparative analysis of dimension of the theories of action above presented it is possible to preliminarily group these dimensions into two theories of action for institutional innovation: *instrumental-mechanistic* corresponding to the supply driven and science-driven periods, and *economic-strategic* prevailed in the demand-driven period. This classification will be elaborated upon with the analysis of other cases that are presented in the next two chapters.

Research question 3: What are the driving forces of the institutional innovation processes in IDIAP?

The main driving forces of institutional change have been summarised in Table 5.2. Some forces are external to IDIAP, such as agro-technical change, international co-operation, market and producer demands and agricultural policies. In this sense, the need for a *correspondence with its external context* can be seen as one of the driving forces. On the other hand, organisational sustainability, 'scientific productivity' and efficiency of research & technology transfer processes are internal driving forces. The tensions between the theories of action and organisational practices, and the differences in opinion and perception of internal actors about institutional change, suggest that the *search for internal consistency* can be seen as an important driving force towards institutional change.

I will return to the IDIAP case in chapter 8 where the synthesis of the three cases is presented. I conclude this chapter with the following remarks:

- Without the commitment of civil servants, institutional change efforts in public R&D organisations are unsustainable in the long term.
- Changes in IDIAP were directed more to changing 'hard things' (organisational processes), expecting that involvement in reconfigured processes will be enough to lead people to change.
- The learning process is always a change process; therefore, changes in individual and organisational *praxis* can be seen as indicators of learning; There is some evidence presented in this chapter that suggests that at the individual level, the institutional change process during 1995 - 1998 was intensive full of learning experiences.
- An important role in IDIAP's institutional innovation processes was played by international donors, funding agencies and international research centres. The dynamics of collaboration with the ISNAR PM&E, project offered new insights and perspectives that contributed to increasing the conceptual and methodological autonomy of IDIAP professionals.

Chapter 6. Institutional Innovation for Rural Resources Management: The case of Environmental NGOs in Panama

6.1 Overview

While many RR&D organisations have only partially incorporated the environmental variable into their research agenda, environmental NGOs (ENGO) have been organised mainly as a result of a preoccupation with and commitment to new conceptual and methodological perspectives on environmental and rural resources management. Moreover, ENGOs develop their interventions within the paradigm of sustainability that includes a holistic worldview and a participatory approach to the process of knowledge generation within multi-actor platforms for managing ecosystems.

As noted in Chapter 3, development models do not implement themselves; they need a set of organisations and institutions to legitimise their premises, to implement their 'solutions' and to accomplish their promises. Where a development model goes, so do its corresponding development organisations. The last decades of the 20th century were characterised by the collapse of most socio-economic development models, which had been a global reference point for shaping national policies in most developing countries. The change of epoch continues to challenge the founding premises and assumptions of existing ENGOs. How are they then (re)defining their identity and their role in society? How are their peculiar characteristics, circumstances, worldviews, paradigms and modes of intervention reflected in their organisational *praxis* for institutional innovation?

This chapter presents the case study of institutional innovation of Panamanian ENGOs. Based on information gathered from fieldwork, the importance of Panamanian ENGOs, their main characteristics as well as the recently implemented changes affecting their organisational and institutional dimensions are presented. Second, the institutional change process of two ENGOs participating in the Institutional Strengthening Programs (ISP) being carried out in Panama are analysed. Third, the major elements of theories of action that inform institutional innovation processes in ENGOs are summarised and compared. Finally, the main conclusions and remarks concerning this case are presented.

6.2 Research design

The general objective of this case study was to better understand how participation in activities of Rural Resources Management (RRM) influences the theories of action for institutional innovation of ENGOs in Panama. Specifically, the research was oriented to:

- characterise the situation of ENGOs in Panama;
- analyse their experiences of institutional innovation;
- identify the theories of action that inform the processes of institutional innovation of ENGOs in Panama;

6.2.1 Research questions

The analysis of ENGOs's institutional innovation should provide insights necessary for answering the following research questions:

- What kinds of organisational and institutional changes have ENGOs recently implemented?
- What are the theories of action that inform the institutional innovation processes of ENGOs in Panama?
- How are institutional innovation processes of ENGOs affected by the theories of action of the donors and facilitators who fund and support them?

6.2.2 Fieldwork activities

Since 1998, the author has acted as a facilitator for a NGO institutional strengthening program carried out by NATURA Foundation[32]. The in-field research activities carried out in 2001 (see Figure 6.1), included the application of a questionnaire, semi-structured interviews and group discussions during participatory reflective workshops.

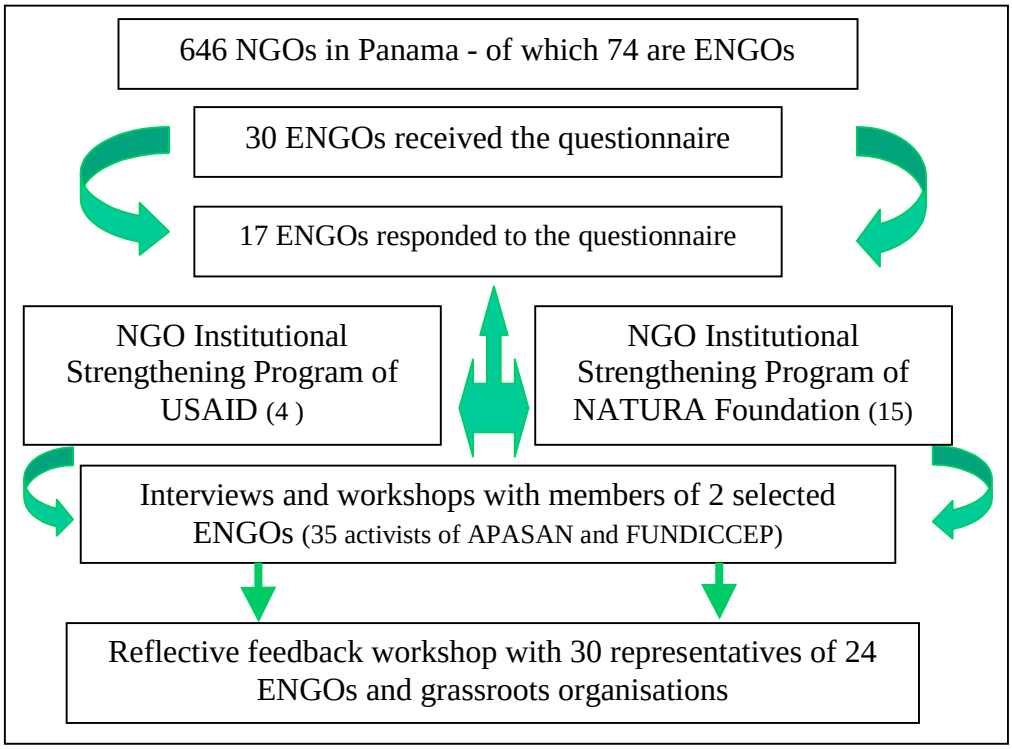


Figure 6.1 Fieldwork research schema

[32] NATURA Foundation "*is a private, non-profit organisation founded in Panama in 1991. As an administrator of national and international funds, Fundación NATURA has become a leader in the promotion of sustainable development projects and in the strengthening of the environmental sector of civil society in Panama. In addition, it is a member of the World Conservation Union and the Network of Environmental Funds of Latin America and the Caribbean* " (NATURA, 2003).

In 2001, I applied a structured questionnaire (Annex 2) to obtain an overview of the current characteristics of ENGOs in Panama and their experiences in organisational and institutional innovation. The questionnaire was designed to gather general information, as well as specific information about changes regarding the organisational and institutional dimensions of ENGOs. During the fieldwork from August to December 2001, face-to-face interviews were conducted with representatives of up to 30 organisations to personally deliver the questionnaire, explain the study's objectives and to enhance response rate. The ENGOs to visit were selected according to the following criteria:

- The organisations should have been active (i.e., ad hoc NGOS were not included).
- A substantial part of their activities should be within the fields of RRM.
- The organisations should not be only educational or only research organisations;
- NGOs should have participated in activities of one of ISP.

Finally, 17 ENGOs responded to the questionnaire. From these 17 ENGOs, four are participating in USAID's ISP, and 15 have participated in activities of NATURA's ISP. This means that two ENGOs have participated in both programs. In two organisations that responded to the questionnaire (APASAN and FUNDICCEP), consultations were undertaken to agree on additional fieldwork activities. These two ENGOs had been selected according to the following criteria:

- They are implementing RRM projects.
- They were interested in the issues raised by the study.
- They are undergoing institutional change processes.
- APASAN is participating in USAID's ISP;
- FUNDICCEP has participated in most activities of NATURA's ISP.

During the fieldwork, I had the opportunity to participate as an observer and facilitator in three workshops of these two ENGOs. The workshops allowed me to document and to review in a participatory way the advances of the respective processes of organisational change of these two ENGOs. The workshops consisted of an introductory presentation by one facilitator, followed by group discussions and a presentation of results. Thus, the participants (35 in total) of the workshops analysed their experiences and agreed which organisational and institutional aspects of their organisations needed to be improved, and which factors facilitated or restricted the change processes.

The role of the researcher was to facilitate the group discussions and presentations. So, through participatory action-reflection, I obtained relevant information for my study and supported these organisations in their processes of change. The information generated was summarised, written down and reported in the workshop proceedings. In some cases, the results were immediately incorporated into their institutional profiles[33].

A wide range of organisational documentation and tape-recorded materials was collected for further interpretative content analysis. In addition, written notes and literature were also gathered to fulfil the objectives of the present case study. For the interviews with managers and facilitators of the ISPs, I used a semi-structured questionnaire (Annex 3).

[33] A short description of the organisation that is submitted to donors when applying for funding.

Finally, the preliminary findings of this research were shared and validated in a reflective feed-back workshop with 30 representatives of 24 ENGOs and grassroots organisations, including representatives of 10 ENGOs that had responded to the questionnaire. During the workshop, I made a presentation followed by a plenary session during which participants commented on it. Then, some participants were invited to share their experiences with institutional change, and the on-going initiatives of establishing NGO network, alliances and coalitions were presented. Finally, participants worked in groups to agree on the factors facilitating and restricting the institutional innovation process both within their organisations and at the inter-organisational level.

6.3 Importance and role of ENGOs for RRM in Panama

During the 1980s and 1990s, NGOs began to flourish in Panama. As we can see in Figure 6.2, between 1995 and 2001, an extraordinary increase in the number of NGOs took place.

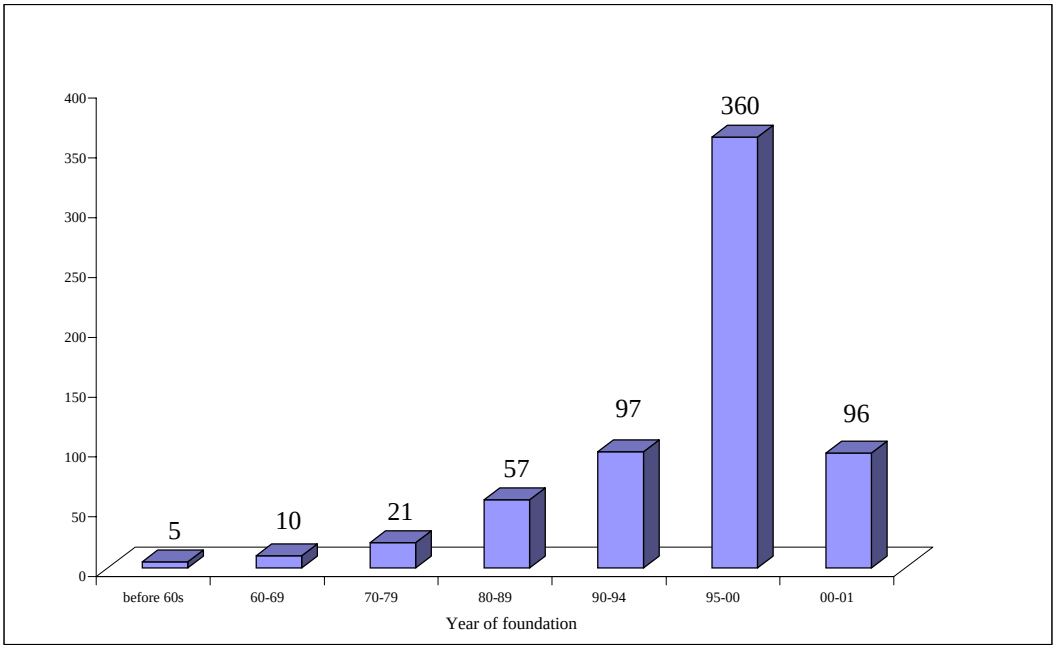


Figure 6.2 NGOs in Panama by year of foundation (based on MEF, 2001)

These organisations are intended to fill the gap between the government and international agencies, and the population. As in other areas of the world, Panamanian NGOs operate in a changing context encouraged by economic, political, technological, social, organisational and institutional factors. It is important to note at least two of the factors that have recently affected NGO dynamics:

- ***Structural adjustment policies and reforms of public administration.*** Structural adjustment policies (especially privatisation of public services) and public administration reforms have brought opportunities and challenges to civil society organisations. Market and private initiatives are seen as the most efficient mechanisms to obtain economic growth and to provide the most inclusive access to the population. The reduction of the role of the State and privatisation of public services have represented an opportunity for many NGO to become suppliers of services in technology transfer, health and education, among others. In Panama, the major state companies providing services (IRHE and INTEL) were privatised in 1995. In particular the IRHE (the provider of electricity) had several departments in charge of watershed management and protection. With privatisation, these departments were

drastically reduced or eliminated. As a result, some former civil servants of privatised state companies became NGO activists.

- ***Foreign assistance.*** Funding, from government programs and bilateral, multilateral and private sources, has been a driving force in NGO dynamics. Over the past decade, many funding agencies have redirected their funds away from the government to NGOs and private consultants. Many governmental projects and programs funded by the WB and IDB are implemented by NGOs and private consultants. In fact, one of the current large scale projects implemented by the Panamanian government, with funding from the WB - the "*Rural Poverty and Natural Resources Management Project*"- is locally carried out by NGOs (MIDA, 2003).

As a result, NGOs are reassessing the way in which they can put their approaches into practice, establish alliances, and negotiate the terms of engagement with government and other funding agencies.

The organisational mandate of NGOs comprises a broad range of themes (see Figure 6.3).

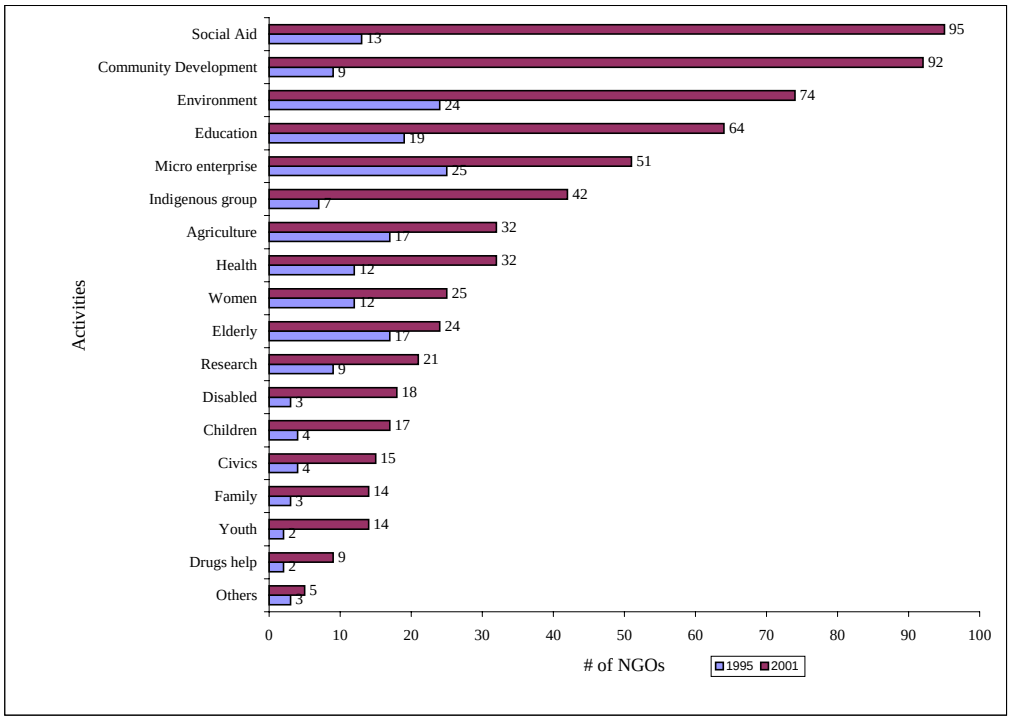


Figure 6.3 Increase of NGOs in Panama according to their main activity (based on MEF, 2001)

Some of these organisations focus on a specific at-risk population, such as indigenous communities, youth, the elderly, children, women, or people with disabilities. Others focus on improvements in a certain aspect of the quality of life, such as social aid, agriculture, health or environment. Still other NGOs choose a specific focus, such as micro-level enterprise development, community development and education.

Information in Figure 6.3 highlighted that the increase in the number of NGOs is more spectacular in some activities. If compared to the number of NGOs according to activity in 1994, the increases in 2001 are impressive (see Table 6.1).

Table 6.1 Increase in NGO according to activity from 1994 to 2001

Main NGO's activity	*Increase in %*
Community (local) development	922
Social aid	631
Youths	600
Handicapped	500
Indian communities	500
Drugs	350
Children	325
Family	275
Education	236
Environment (RRM)	208

These figures are deceiving, however as not all NGOs are genuine bodies. Many NGOs are little more than '*ad hoc arrangements*' aimed at administering governmental and foreign financial support to local initiatives. In some cases, only a few 'dedicated professionals' or activists are members of more than one NGO at the same time. Some criticisms have been addressed to 'profit-making NGOs' for the lack of transparency in managing donor funds and for using them mainly for salaries and expense allowances for their officials. In addition, it has become 'normal' for some public organisations to organise a parallel 'Governmental NGO' to receive donations and to avoid state control over these funds (Santamaria, 2002).

To give an indication of the importance of ENGOs in Panama, three areas of RRM in which they are participating or playing a key role are presented below..

- **ENGOs and the Atlantic Mesoamerican Biological Corridor:** The Atlantic Mesoamerican Biological Corridor (CBMAP)[34] covers 3 million hectares of terrestrial and marine areas corresponding to 39.7% of the national territory bordering on the Atlantic Ocean. Despite its name, the CBMAP is not just a conservation project. The project promotes "*sustainable development and the improvement of living conditions of rural communities through the conservation, sustainable use and management of biological diversity*" (CBMAP, 2001). The region is home to numerous indigenous (*Ngöbes-Buglés, Naso-Teribes, Kunas* and *Emberaes*) and Afro-American communities whose livelihoods are inextricably linked with their natural environment. ENGOs are actively implementing this project and promoting the participation of local communities to ensure that issues such as sustainable development and rural poverty are fully addressed.

- **ENGOs and the Panama Canal watershed**: The co-ordination of human activities that are carried out in critical ecosystems such as the Panama Canal Watershed (PCW) is essential for the conservation of forests, and sustaining biodiversity and hydrological resources. Such integrated management will directly benefit the PCW ecosystem, the 143,000 residents living in the PCW, the urban populations of Panama City and Colon, the industrial sector which depends on fresh water for industrial uses, and the operators and users of the canal. The indirect beneficiaries will be the 1.4 million people located near the canal, the population of Panama as a whole and the national and global economy. At the moment, a plan exists to

[34] The CBMAP is part of the Mesoamerican Biological Corridor (MBC), which has been described as the largest and most complex sustainable development project to date, focusing on all Central American countries from Mexico to Panama. The Mesoamerican Biological Corridor was established in 1997 by the presidents of the seven countries of Central America: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama. It was drafted, funded, and implemented with the assistance of the Global Environment Facility (GEF), UNDP, UNEP and the World Bank.

extend the PCW. This issue is of great importance as much to Panama as to the users of the Panama Canal. According to its promoters, such an extension will allow the construction of a third set of locks that is seen as the decisive factor for the 'modernisation' of the water route. The management of the PCW and the participation of all stakeholders represent a great challenge because of the complexity and diversity of actors. Participatory perspectives, empowerment and gender approaches for working with the rural communities that form part of the PCW could be part of the contribution of ENGOs to this national issue.

- **ENGOs and the management of protected areas**: There are 14 National Parks in Panama, which cover 1.9 million hectares of protected area. The area under protection represents 25% of the national territory (ANAM, 2003). Within these national parks, ENGOs are carrying out projects to protect and conserve ecosystems, ecological processes, and the species of flora and fauna inhabiting the ecosystems. ENGOs are supporting different initiatives for protected areas, as a means of securing the long-term ecological sustainability of the parks. Technical assistance will be provided to further develop ecotourism opportunities for local communities and to create co-management platforms for protected area management. In addition, some ENGOs are supporting local communities that are struggling for a space in the environmental management of their rural resources.

Without internal innovation, ENGOs will not be able to be innovative in their external context and to face the challenges that represent the complex RRM issues that they are trying to address. For development organisations in general, and for the NGOs in particular, they will have to make ethical and political decisions to coherently define their worldview, mode of interpretation and their theories of action in correspondence with the future view of 'sustainable human development' [35].

6.4 General characteristics of ENGOs

This section provides an overview of the basic characteristics of ENGOs, based on the information gathered from the questionnaires and semi-structured interviews. It is important to stress here that the 17 organisations participating in the study are not comparable due to their differences in size, organisational structure and capacity for RRM. Beside this, the information presented refers to aggregate characteristics of the 17 organisations that responded to the questionnaire, which were selected purposely (not randomly), and therefore does not intend to be a generalisation for the rest of NGOs organisations in Panama.

6.4.1 Size, members' age, gender composition and scholarity

In 2001, the youngest organisations had existed for only two years and the oldest had been operating for 24 years. The average 'age' of the organisations was 10 years and the median, 9 years. Five organisations were created before 1990, 6 between 1990 and 1993 and 6 after 1994. The largest ENGO had 33 members and the smallest, 5. On average, these organisations had 17 members. A majority of the organisations work at the national level (60% of total organisations). Some ENGOs are split into associations at national, provincial, and municipal levels.

With respect to the age of membership, according to the information, 58% of members were between 31 and 45 years old; 21% were between 19 and 30 years old, and 19% were between 46 and 60 years old. In spite of a prevalence of people between the ages of 31 and 45, not only in

[35] In its mainstream interpretation, 'sustainable human development' is not different from the concept of 'sustainable development' or just 'development', meaning that developing countries should follow the track of western industrialised societies and economies (see chapter 1, section 1.2).

general but also in most of organisations (13 of 17), one can see from the data is that the membership of ENGOs is very heterogeneous with regard to age.

The gender composition of organisations is illustrated in Figure 6.4. According to the information collected, 64.5% of the membership of ENGOs (293 activists) are men. Only in four organisations do women surpass men in number, and in one organisation, the number of men and women was equal. On average, the participation of women in ENGOs was 38.3%, (the median being 40 and the mode, 60). Figure 6.4 shows that in the second largest organisation (here shown as organisation number 1), the relative participation of women is too low (6.25%), compared with the rest of the organisation. This situation is probably related to cultural and social aspects of this particular organisation[36].

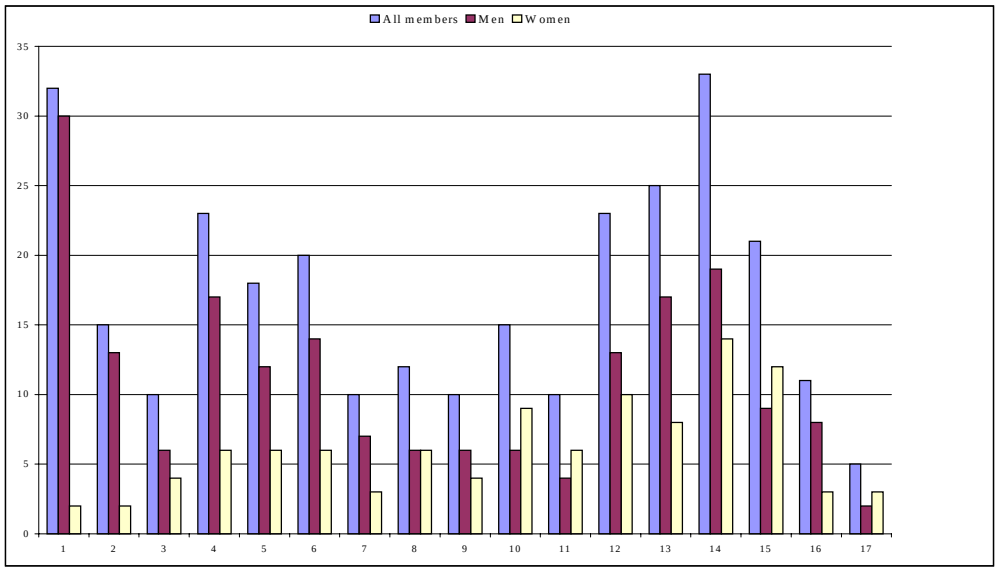


Figure 6.4 Distribution of members of ENGOs by gender

According to the collected information, 67% of ENGOs' members have a high level of education. The distribution of members by level of formal education is shown in Figure 6.5.

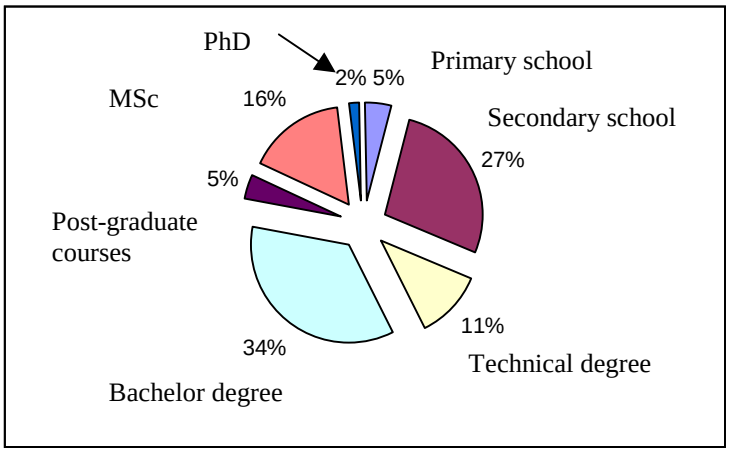


Figure 6.5 Distribution of members of ENGOs by level of education

[36] In the past this organisation was a 'student's association', and constitutes exclusively by people from one of the largest indigenous ethnic groups in Panama.

Most of them are '*Licenciados*' - the equivalent of a US bachelor's degree (34%), '*Técnicos*'- specialised technical level of education (11%) and people who followed post-graduate education at different levels, such as specialised programs MSc and PhD (23%).

6.4.2 Funding sources and major activities of ENGOs

ENGOs in Panama raise funds from a variety of national and international sources. In Figure 6.6, the projects executed by ENGOs during the last five years are grouped according to their funding source.

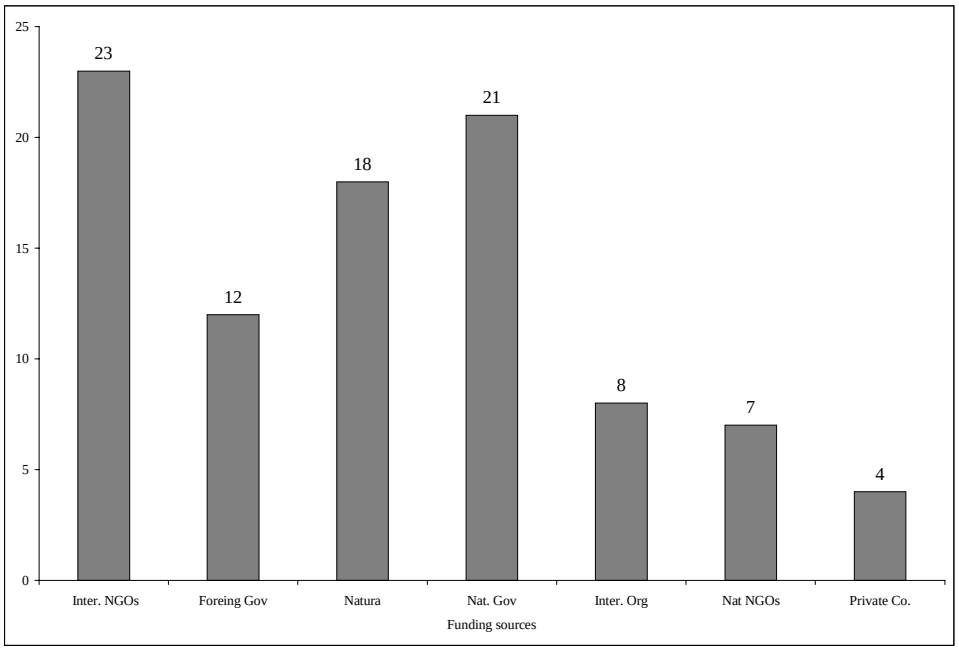


Figure 6.6 Distribution of executed projects by funding source (1995-2001)

The ENGOs reported the execution of 93 projects between 1995-2001, using an amount of 10.97 million *balboas* of investment. The most common funding sources for the ENGOs in this study are international NGOs and the second most common is the national government (mostly through MIDA, ANAM and the Ministry of the Presidency). For international NGOs (NCI, Manos Unidas, UICN, WWF, TNC, EZE), Panamanian ENGOs are playing the role of ***bilateral partners*** in delivering aid, promoting environmental conservation and raising public awareness about ecological services. In terms of the national government, ENGOs usually act as ***contractors*** or intermediaries in the application of public funds.

Significant sources of funds for ENGO projects in Panama are also the NATURA Foundation and bilateral governmental funds offered by different foreign embassies and diplomatic representations (USAID, JICA, AECI, IDRC)[37]. To access these funds, ENGOs have to elaborate a project proposal in which they are the ***project executors***. Project proposals have to be framed according to the donor's requirements. Due to the small number of submitted proposals vis-à-vis the availability of funds, the development of ENGO capacities to formulate proposals for the sustainable management of natural resources has become an important issue for institutional strengthening programs.

[37] Japanese International Cooperation Agency (JICA); Spanish International Cooperation Agency (AECI); International Development Research Centre (IDRC).

Still, multilateral organisations, national NGOs and private companies are also funding some of the projects.

Regarding their activities, a majority of ENGOs focus on very specific issues, such as capacity-building for RRM, facilitation and community support, consultancy and legal support, conservation of natural resources (NR), environmental management of NR, among others.

Most ENGOs are essentially ***support organisations*** in the sense of assuming a role in assisting local community organisations in their RRM activities. From the information given by ENGOs, the following activities were mentioned (see Table 6.2).

Table 6.2 Activities carried out by ENGOs

Major activities	*Number of ENGOs that reported the activity*
Capacity-building for RRM	15
Facilitation and community support	14
Consultancy and legal support	14
Conservation of NR	12
Environmental Management of NR	12
Reforestation	6
Production	6
Research	5
Ecotourism	5
Advocacy	1
Rural credit	1
Community commercialisation	1

The majority of ENGOs reported permanent linkages with other ENGOs. The co-ordination of activities, implementation of projects, and the creation and strengthening of different types of organisational configurations among ENGOs have recently been stressed by the two existing institutional strengthening programs.

Different initiatives of national and regional NGOs and grassroots organisations have come together to form associations, alliances and networks such as the Alliance for Environmental Development of Highlands (ADATA), the Network for Community Development (REDECO), the Network of Environmental and Agroforestry organisations of Cocle (REGAAC) and the Network of Environmental and Agroforestry Organisations of Capira (ROCAA). In addition, integration into regional networks such as the Latin American Network for Community Marketing (RELACC) and the Latin American Development NGO Network (ALOP) are being favoured.

Some ENGOs reported linkages with grassroots organisations and producers' associations. A smaller number of organisations mentioned permanent links with universities and research organisations, e.g., CATIE, University of Panama and STRI.

6.5 Reported changes in ENGOs

As a result of the changes in the role of the state in the economy and the privatisation of public services, ENGOs are reassessing their mission, objectives, strategies and modes of intervention, and redefining the role they will play in rural development and society as a whole. Therefore, many of them are concerned with the foundations of their organisation's legitimacy, the

pertinence of their products and services, the relevance of their contribution, and their relationship with other actors for rural resource management.

Changes reported by ENGOs can be grouped into two categories: (i) those changes that affect their organisational dimension; namely, alterations in products and services offered and in their organisational management and PM&E processes; and (ii) those changes that affect their institutional dimension; namely, modifications in their identity, mode of intervention and mode of interpretation.

Specifically, the ENGOs that responded to the questionnaire reported the following:

1. Changes affecting the **organisational dimension:**

   - The following 'new products and services' are offered by some ENGOs*:*
     - *environmental audits;*
     - *administration and execution of rural development projects;*
     - *specialised consultancies;*
     - *institutional strengthening of grassroots organisations;*
     - *legal assistance;*
     - *generation of alternative agricultural technologies; and*
     - *administration of funds for RRM.*
   - Alterations in ENGOs' management model and PM&E system
     - *adoption of strategic planning process;*
     - *re-organisation by project;*
     - *decentralisation of decision-making processes;*
     - *stakeholders participation in project evaluation;*
     - *use of logical framework for planning and monitoring;*
     - *bottom –up planning with community participation;*
     - *systemic management model;*
     - *collective, participatory model of management;*
     - *decision-making process through community participation;*
     - *social management of NR;*
     - *decision-making by consensus; and*
     - *abandonment of paternalism and adoption of facilitation of processes.*

2. Changes affecting the **institutional dimension** of ENGOs.

   - Modifications in ENGOs' identity and mode of intervention*:*
     - *reformulation of organisational vision and mission;*
     - *reformulation of mission and objectives at program level;*
     - *change of organisational statutes;*
     - *re-definition of organisational objectives; and*
     - *re-definition of organisational purpose towards environmental and ecological issues.*

   - The following theoretical and methodological approaches have been incorporated into ENGOs' conceptual framework or mode of interpretation:

     - *systemic approach;*

- *participatory approaches (Community participation, Participatory rural Development, Participatory M&E);*
- *strategic planning approach;*
- *gender approach;*
- *adult education;*
- *popular education;*
- *constructivist methodologies;*
- *holistic approach; and*
- *community management;*

Regarding the source of information and support received for implementing these changes, the ENGOs responded as follows:

Table 6.3 Source of information for changes

Source of information	*Frequency of responses*
Personal experience	10
Members' proposal	9
Suggestion of donors	5
Other NGO or Network	4
Private consultants	2

Table 6.4 External support for change

Support for implementing changes	*Frequency of responses*
Participation in workshops	9
Exchanges with other NGOs	8
Specialised consultancies	5
Subsidies and donations	4

According to the respondents, these changes had the following positive results on the ENGOs:

Table 6.5 Results of implementing changes

Organisational performance	*Frequency of responses*
Greater social recognition	7
Greater access to sources of funding and donations	6
Greater pertinence of products and services	5
Reduction in costs	1

From the analysis of reported changes, the following remarks stand out:

- The ENGOs experienced a significant advance in the process of mission, vision and objectives formulation, with a long-term perspective and the use of strategic planning. Whereas in 1998, one of 15 ENGOs had a strategic plan (Santamaría & González, 1998), this research found that from the 17 organisations that responded to the questionnaire, 11 reported their long-term vision and 14 reported both the mission and the organisational objectives.

- Economic social worldview was predominant in the implementation of most organisational changes. Consequently, the "*images of organisation*" that predominated are of being a "*provider of products and services*" and being a "*market agent*", which influences the kind of changes that have been implemented.

- Adaptive, instrumental types of organisational changes predominated, responding to the perceived funding opportunities and donor requirements, with little preoccupation with the institutional dimension of the organisation.

- Many 'fashionable' approaches are listed and included in ENGO conceptual frameworks, but they are not institutionalised. In some cases, I personally perceived from the interviews with ENGO activists that they did not know what some of the adopted approaches were about, and neither were they practised. As one of the interviewees said with regard to a gender approach: *"In the blacksmith's house, the knife is made of wood",* for which she meant that the *"organisation is promoting a gender approach, but it is not practising it internally*" (Interviewee 45, this research). This implies that the organisations have a low level of conceptual and methodological autonomy with respect to the donors and to the programs of institutional strengthening in which they are participating.

A more in-depth analysis of theories of action that inform the processes of institutional innovation in ENGOs is presented in the next section.

6.6 Praxeology of institutional innovation for RRM

The two institutional strengthening programs currently being implemented (NATURA's ISP and USAID's ISP) play a very important role in the promotion and facilitation of ENGOs' institutional change processes.

6.6.1 The NATURA institutional strengthening program

While administering funds for RRM, *Fundación NATURA* recognised the value of providing organisational support, as well as financial support, to the ENGOs. For this reason, and responding to the demands of environmental organisations, *Fundación NATURA* formally initiated the NGO's Institutional Strengthening Program in 1998. The program's purpose was defined as: "*to strengthen the institutional capacity of NGOs, community organisations, and educational entities, for the formulation, management and sustaining of environmental projects, and to promote the development of new environmental initiatives within a participatory and integrative process"* (NATURA, 2001).

The general objective of the program is; "*to contribute to the development of a strong and extensive base of NGOs, community organisations, and educational entities with the capacity to sustainable manage the nation's renewable natural resources, and to participate in the formulation and implementation of a national environmental strategy*" (NATURA, 2003).

The NGO's ISP was developed with the following specific objectives:

- *"to strengthen the capacity of the non-governmental sector and environmental groups so that they may formulate, promote, and execute projects that contribute to the protection, conservation, and recovery of biodiversity and natural resources;*

- *to encourage community participation in the definition and execution of sustainable environmental projects;*

- *to promote the transfer of technology and experiences among beneficiaries, environmental groups, government entities, and civil society; and*

- *to identify and encourage space for discussions to increase the participation and influence of environmental organisations in the process of formulating and implementing policies and environmental strategies* (*ibid.*).

After the program's first evaluation in 1999, the following strategic objectives were added to the program design for the 2000-2003 period:

- *"to strengthen the institutional capacity of NGOs, community and educational organisations, for their participation in the formulation, management and sustaining of environmental projects and initiatives, within an integrative and participatory process;*

- *to strengthen the effectiveness of NGOs, educational organisations and environmental entities to identify and prioritise environmental problems and necessities, and to organise stakeholders to face these problems"* (NATURA, 2001:2).

In addition, for each of the previously defined **components** (capacity strengthening, identification and development of environmental initiatives, and promotion of participation), the major topics, issues or activities to be implemented or accomplished were defined (see Table 6.6).

Table 6.6 NATURA ISP's components and contents

Capacity strengthening	**Identification and development of environmental initiatives**	**Promotion of participation**
• Strategic planning • Social management • Administration and accounting • Marketing and commercialisation • Organisational and administrative development • Methodology for environmental assessment • Informatics and management of environmental projects • Elaboration of environmental educational programs	• Proposal formulation • Handling of solid waste • Growing of wild animals • Prevention and control of forest fires • Organic agriculture • Management and conservation of water resources • Establishment and administration of breeding grounds • Development and management of hostels and ecotourism projects • Growing and handling of cattle with alternative techniques	• Community organisation and planning • Gender approach and sustainable development of environmental projects • Training of extension agents • Human development • Working methodologies for sustainable development

Source: Natura, 2001.

The program has incorporated a wide variety of strategies in order to take advantage of the diverse experiences of NGO activists and facilitators. In order to achieve greater impact, participatory didactic methods have been included in activities such as seminars, workshops, mini-workshops, conferences, courses, and field visits.

The NATURA's ISP program has included workshops and training courses (26 and 6, respectively, out of 41 activities carried out from 1998 until 2001). Among the workshops, 11 were on "*Formulation of proposals for sustainable development*"; four on *"Financial administration of projects*"; and four on *"Strategic planning and training of directors of civil society organisations*". Among the training courses, four were dedicated to train NGO activists in "*organic agriculture*" (*ibid*.:4).

According to NATURA, over 400 individuals have participated in its ISP activities since the program began in 1998. Representatives of more than 200 organisations have taken part in and received direct benefits from the program (NATURA, 2003).

From the external evaluation of this program in 2001, it is clear that 85% of ISP's beneficiaries, who participated in the evaluation, recognised the positive impact of the program in their organisational performance. Highlights in this external evaluation were the workshops on "*formulation of proposals", "financial administration of projects*", and "*community organisation & NRM within a gender approach*" as well as the training course on the "*organic agriculture*" as being the activities that have made a major contribution to the institutional strengthening of ENGOs (NATURA, 2001).

One of the ENGOs that has consistently participated in the activities carried out by NATURA's ISP, is *La Fundación para el Desarrollo Integral del Corregimiento de Cerro Punta* (FUNDICCEP). In the next section its process of change is presented.

6.6.1.1 The institutional change process of FUNDICCEP

Brief history

The Foundation for the Integral Development of Cerro Punta (FUNDICCEP) was created in October 1996 to co-ordinate the different NGOs, conservation programs and grassroots organisation in the locality of Cerro Punta. Cerro Punta is a large hillside community in the highlands area of Chiriqui. Most of this area is part of the La Amistad Biosphere Reserve and its buffer zone. La Amistad Biosphere Reserve is a 1.8 million hectare park extending from southern Costa Rica into Panama.

Numerous initiatives for protecting this area have been implemented. One of these was the AMISCONDE project. The "*Amistad, Conservación y Desarrollo*" (Friendship, Conservation and Development) or AMISCONDE Project, began in 1992 as a result of a donation to Conservation International (CI) from suppliers of the McDonald's Corporation. The project was conceived as an international initiative between Panama and Costa Rica to promote sustainable development and conservation.

Implemented in Panama, by the *Fundación para el Desarrollo Sostenible de Panamá* (FUNDESPA), in collaboration with CI, the project's objective was to establish a harmonious relationship between La Amistad Biosphere Reserve's conservation objectives and the integrated development objectives of the communities within the 6,000 hectares buffer zone.

The project set up a proactive management strategy and participatory methodologies that worked directly with the local residents on issues including forestry, agriculture, soil conservation, environmental education and community development. AMISCONDE community development activities included the organisation of producers, teachers, community representatives and youths in environmental associations for the protection of natural resources, education of children in environmental activism, and the implementation of environmental education actions.

The creation of FUNDICCEP was part of the local community strategy to take over the project. Starting in 1997, AMISCONDE delegated part of its functions to FUNDICCEP and provided funds for its functioning. When the AMISCONDE project concluded in 1999, FUNDICCEP was ready to continue on its own the activities to broaden the scope of alliances and funding sources.

In 2000, FUNDICCEP took over AMISCONDE's infrastructure and equipment and started working with other neighbouring communities to create a network of development organisations – the Alliance for Environmental Development of the Highlands (ADATA).

Since 1998, the NATURA's ISP has supported the process of institutional change at FUNDICCEP. This support includes the participation of FUNDICCEP representatives in workshops, the organisation of exchanges with other ENGOs, the provision of funds for meetings and workshops and the facilitation of technical assistance during the institutional change process. The main elements of FUNDICCEP's institutional change process of are presented are presented in the next section

The process

The reflective process towards a definition of the major elements of FUNDICCEP's identity followed an adapted methodological framework (see Figure 6.7) developed by ACCESO Foundation[38].

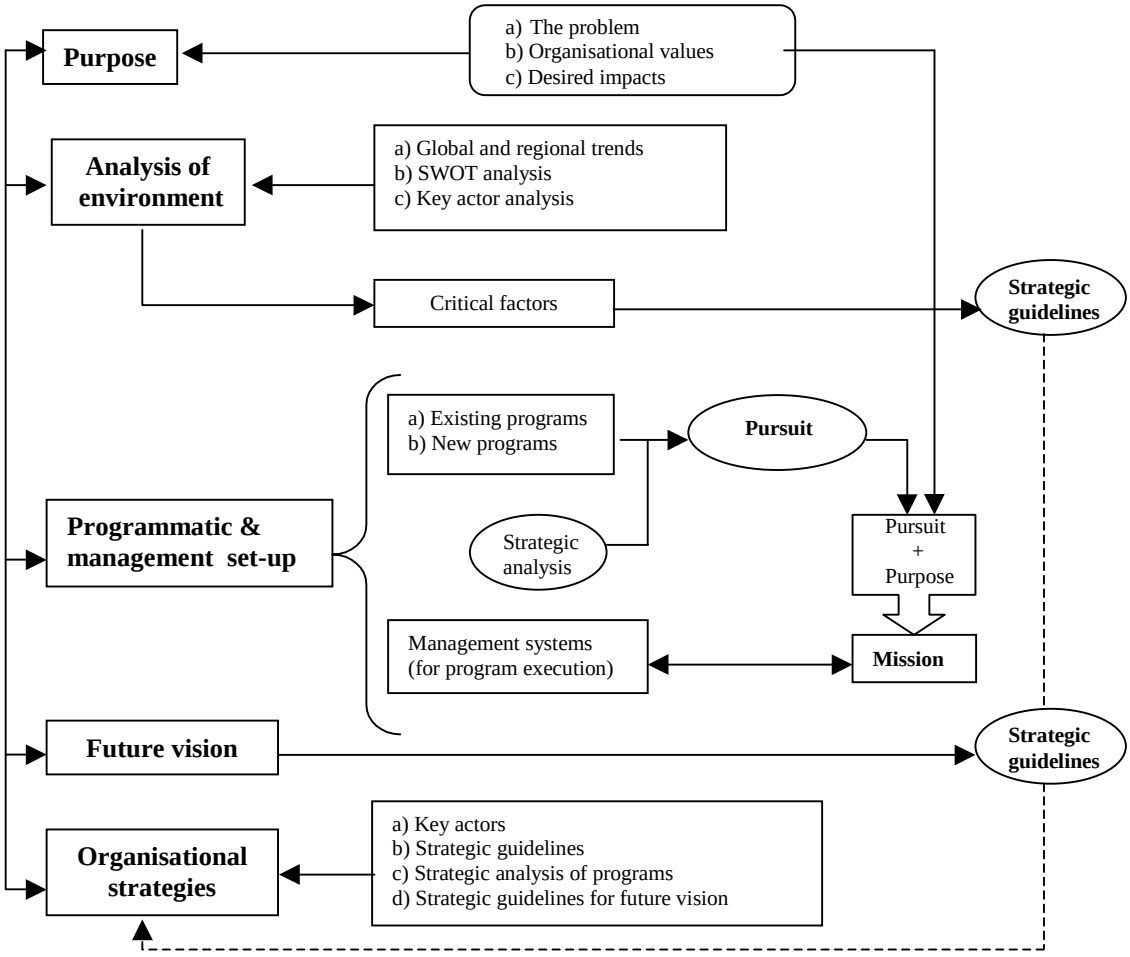


Figure 6.7 Macro-steps for strategic planning of FUNDICCEP

[38] ACCESO Foundation is a private not-for-profit development organisation based in San Jose, Costa Rica. ACCESO provides training, technical assistance and other capacity-building services for local, national, regional and international organisations "*that share our commitment to equitable, participatory and sustainable development practices*" (ACCESO, 2003).

The process starts with and introductory session in which participants share objectives and the macro-steps of the planning process. Then the process continues with 5 modules, each of which corresponds to the elements highlighted on the left of the diagram (Purpose, analysis of the environment, programmatic and management set-up, future vision and organisational strategies). In the case of FUNDICCEP, it took up to three two-day workshops to finish the planning process.

The NATURA facilitator used the brainstorming technique, combined with a card system and working group sessions. For each topic (module) the results were summarised and displayed (on posters) during the sessions following (see Figure 6.8). In this manner, it was possible to review previous results for consistency and to modify them if necessary. I had the opportunity to personally observe this process during the second workshop.

Figure 6.8 FUNDICCEP's strategic planning workshop

In the second workshop, 15 (out of 33) members of FUNDICCEP participated. The active participation of women in this process is remarkable; 11 of the participants in the second workshop were women (out of 14 women who are members).

The participants agreed on the following elements of identity and organisational structure during the first and second workshops:

Purpose: to c*ontribute to the integrated and participatory management of the Chiriqui Viejo river watershed*.

Pursuit: *the development of socio-environmental activities to sensitise and strengthen community organisation towards a sustainable agriculture*.

Mission statement: *to promote the integrated, appropriate development of the Chiriqui Viejo river watershed through socio-environmental activities for organisational strengthening, community sensitisation and sustainable agriculture*.

Organisational values:

- *responsibility with the conservation of the biodeversity within the La Amistad biosphere reserve;*
- *equitable gender relationship: women participating equally in the decision-making processes;*

- *respect for the diversity of ethnic, religious and social conditions of the population;*
- *ethics, trust, honesty and mutual respect in human relationships;*
- *love and care for nature; and*
- *faith in God, human capacity and community integration, working towards sustainable development.*

Organisational principles:

- *promotion of change of attitude and a new environmental culture;*
- *participation with equality;*
- *decision-making by consensus;*
- *promotion of the community organisations and supporting their efforts;*
- *active participation of the community in the solving environmental problems; and*
- *transfer of technological innovations.*

Organisational programs:

- *promotion of sustainable agriculture;*
- *environmental education (environmental awareness);*
- *strengthening of community organisation; and*
- *waste management* (FUNDICCEP, 2001).

Additionally, during the second workshop, participants agreed to the following facilitating and restricting factors of institutional change in FUNDICCEP.

Facilitating factors:

- *participation in NATURA's ISP;*
- *completing of AMISCONDE project helped FUNDICCEP to grow up;*
- *exchange of experiences with other ENGOs;*
- *changes in the context (increase of environmentalism); and*
- *Need for collaboration with other NGOs.*

Restricting factors:

- *lack of participation of the membership;*
- *financial constraints;*
- *lack of monitoring and evaluation of decisions and their implementation;*
- *lack of communication among members; and*
- *lack of capacity on management of change* (This research);

As stated above, the United States Agency for International Development (USAID) sponsors another ISP of ENGOs in Panama. Its program is presented in the next section.

6.6.2 The USAID institutional strengthening program

The USAID's NGO ISP is considered to be "*the most focused and sustained effort to date to engage civil society in the management of the Panama Canal Watershed (PCW)*". A 'local' consortium of NGO's (SONDEAR, ANCON, CICA and MSI[39]) was recruited to provide

[39] *SONDEAR (The Panamanian Association for Development of Enterprises and Rural Areas) and ANCON (National Association for Nature Conservation) are ENGOs; CICA is the International Centre for Environmental Training that is ANCON's channel for providing environmental education and awareness training, as well as training in forestry and agroforestry techniques; MSI (Management System International) is a USA consultancy firm based in Washington, D.C.*

"*adequate"* technical and training support. The purpose is "*to support through a competitive process, the internal strengthening of an elite set of NGOs to play a significant role in PCW management*" (SONDEAR-MSI-ANCON-CICA, 2001:2).

The NGO ISP's activities are part of a wider USAID support program aiming "*to assist Panama to effectively assume responsibility for the management and protection of the PCW and to serve US interests in the efficient operation of the canal in a sustainable manner*" (USAID, 2003). This support program includes the following objectives:

- "*development and implementation of a comprehensive action plan for the Panama Canal Inter-institutional Commission (CICH) which stresses the adoption of inter-agency agreements with key public players in the PCW as a means of ensuring effective co-ordination;*

- *development of financing planning capabilities for the CICH;*

- *development of a five-year urban environmental infrastructure plan for the PCW; and*

- *development of clear policy guidelines and regulations related to clean production in the PCW; and the coalescing of a network of institutions to conduct environmental monitoring and develop mechanisms to predict impact of activities in the PCW*" (*ibid*.).

USAID is not the only agency interested in supporting the management of the PCW. The IDB and the World Bank are also implementing activities in land management and PCW conservation. The IDB has assisted the Panamanian government in the development of a National Environmental Strategy and is implementing activities to strengthen comprehensive watershed management programs elsewhere in the country. Additionally, Japan is assisting ANCON to establish a training centre in the PCW.

All these efforts are co-ordinated and monitored by USAID. In one of the latest report about USAID activities in Panama, it was stated that "*USAID is working closely with other donors to ensure that all activities are complementary and effectively co-ordinated*" … *USAID continuously strives to identify windows of opportunities in its work with the Panama Canal Authority, ANAM, local governments, NGOs and community groups to ensure that all appropriate actions are taken to promote USAID objectives*" (*ibid.*).

The process of selection of participating ENGOs included of a study of 300 Panamanian NGO; and their sustainability. This was followed by a public competition, in which 126 NGOs were contacted, though only 26 NGOs participated. Finally, the selection committee chose 10 NGOs to participate in the USAID's ISP (Interviewee 35, this research).

The three-year USAID's ISP for NGOs has the following components:

1. "*Strengthening institutional capacity*
    a. *Organisational development: internal capacity*
    b. *Technical and community outreach: external capacity*

2. *Creation and strengthening of networks of NGOs*

3. *Insertion of NGOs and their networks into the sustainable administration of PCW" (SONDEAR-MSI-ANCON-CICA, 2001)*

The institutional strengthening of participating ENGOs is to be achieved as a result of so-called *"education-action methodology*", which articulated action on three levels, as shown in Figure 6.9.

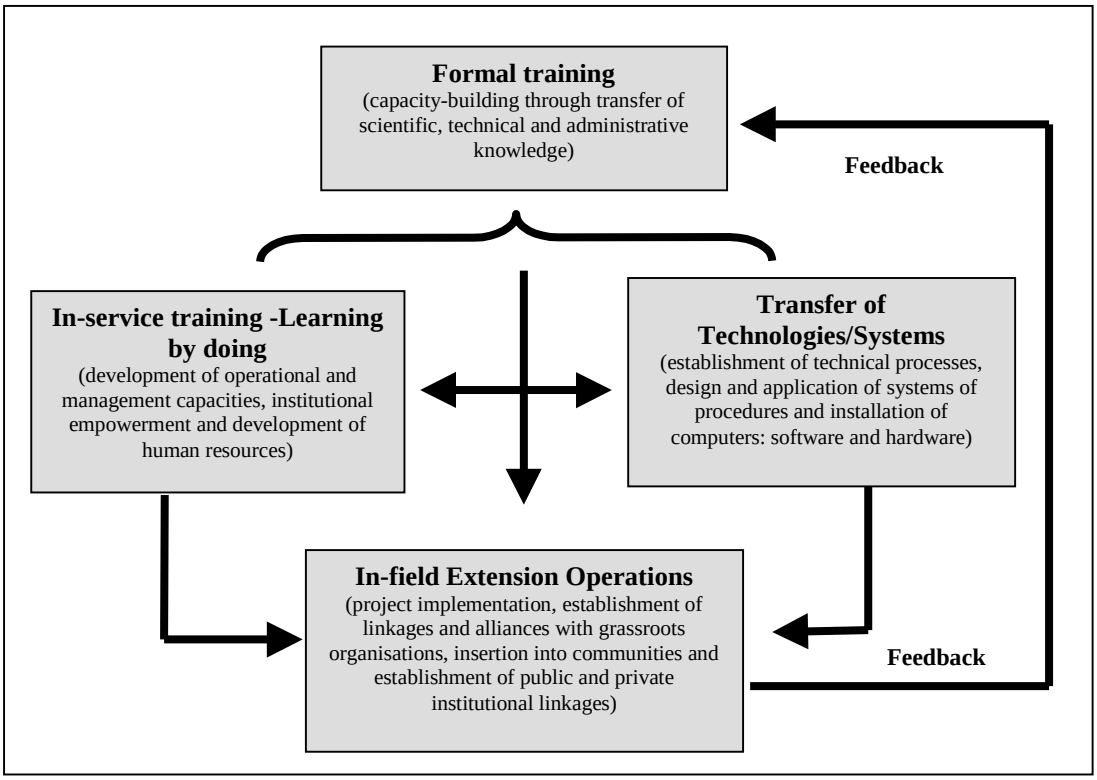


Figure 6.9 USAID's ISP capacity-building framework

The three levels of training area:

- At level I, the formal training is academic, in the classroom, based on training modules consisting of the *"delivery of knowledge"* in workshops *"through conferences, use of didactic materials and the evaluation of assimilation of knowledge".*

- At level II, the in-service training or "*learning by doing*" is based on *"technical assistance by a team of program professionals, who supervise the application of knowledge learned during the formal training program and the transfer of technology for the establishment of management processes into the NGOs' offices".*

- At level III, in-field extension operations *"serve to link and integrate the development of the NGOs' capabilities with grassroots organisations, communities, public and private sectors for the sustainable management of PCW" (ibid.: 7).*

The education - action methodology under the perspective of adult learning, stresses four areas of individual learning:

- "*delivery of knowledge;*
- *development of skills;*

- *improvement of attitude; and*
- *improvement of conducts*" (*ibid.*: 9)

The program is similar to a scholarship. Awarded ENGOs will:

- *receive training for two of their members, through 16 five-day workshops;*
- *receive service training by means of two monthly visits of program specialists* (Interviewee 39, this research);

At the end of the program, each participating ENGO will have among others, the following attributes[40]:

1. Proactive Board of Directors;
2. Clearly defined organisational mission shared by members;
3. A strategic client-oriented plan;
4. Organisational leadership;
5. An appropriate personnel structure and formal policy for human resources development;
6. Diversity as an organisational value;
7. Efficient administrative systems;
8. Management, monitoring & control system;
9. Financially self-sufficient organisation with reliable financial reports;
10. Well-established budgeting planning procedures;
11. High level of credibility and external recognition;
12. High level of commitment to the sustainable management of the PCW;
13. Active website on the internet and well-established international linkages;
14. Membership of environmental network (s) of NGOs; and
15. Good public relations with mass media (*ibid.*).

At the organisational level, a key role is played by the application, control, monitoring and evaluation of the "*Organisational Development Framework*" (see Table 6.7). This framework is part of the *toolkit* developed by MSI[41] and is intended to be used by non-profit organisations to address their shortcomings in the field of organisational development.

As Renzi put it: *"the toolkit may be used to help an organisation, particularly a non-profit organisation, increase its productivity, enhance its impact, improve the organisation as a place to work, and increase the likelihood that the organisation will survive long enough to have a lasting effect on society. In short, the TOOLKIT can help* ***improve the efficiency of a non-profit 'engine'*** *to make it more effective - what we call institutional development*" (Renzi, 1996:469, emphases added).

The purpose of the *MSI toolkit* (organisational development framework, calculation sheet and organisational development profile) is to measure the situation of the NGO regarding some key capabilities that are considered crucial for organisational development and to visualise, monitor and control their improvement (see Table 6.7).

[40] These attributes were part of the presentation made by the USAID co-ordinator of the ISP. In the interview, she referred to this list as "*la carta al Niño Dios*" - the letter to Santa Claus.

[41] MSI (Management System International) has awarded an *"Indefinite Quantity Contract with the USAID to provide services to field missions, regional bureaus and other USAID/Washington offices, as well as direct technical assistance and/or advisory services and assistance to host country institutions*" (MSI, 2003).

Table 6.7 USAID's ISP organisational development framework

Capabilities/ Stages	Start up (1.0 -1.75)	Development (2.0 - 2.75)	Expansion/ Consolidation (3.0 - 3.75)	Sustainability (4.0 - 4.75)
Oversight vision (board, mission & autonomy)				
Management resources (leadership, management, PM&E)				
Human resources (skills, HRD, diversity)				
Financial resources (management, vulnerability, solvency)				
External resources (public relations, alliances, networking)				

Source: Based on Renzi, 1996 and SONDEAR-ANCON-CICA-MSI, 2001.

First, these capabilities are measured to establish a baseline situation. Second, the organisation prioritises the capabilities that are keys to success, and develop a strategy for addressing those issues. The implementation of developed strategies helps the organisation to move along the "*development continuum"* track. Finally, through monitoring and evaluation, the organisation can 'measure' its progress in organisational development towards achieving the stage of sustainability (*ibid.)*

The application of the *MSI framework* for establishing the baselines of the 10 participant ENGOs showed an average score of 3.03 (3.28 for external factors and 2.92 for internal). Regarding the internal capabilities, the higher scores were: 4.03 for financial management and 3.5 for technical capacity of NGO staff. On the other hand, the lower scores were 1.93 for their M&E systems and 2.23 for the development of human resources. Regarding external factors, the highest score was 3.75 for participation of beneficiaries while the lowest was 2.38 for public relations (SONDEAR-ANCON-CICA-MSI, 2001).

ENGOs participating in the program prioritised financial vulnerability and access to local resources as the most important factors for their organisation's survival. The capabilities that were considered as crucial for improvement were financial management, monitoring and evaluation and organisation's autonomy.

The *Asociación Panameña para la Agricultura Sostenible y los Recursos Naturales* (APASAN) is one of ten ENGOs that was awarded scholarship form the USAID's ISP. Its process of change is presented in the next section.

6.6.2.2 The Institutional change process of APASAN

Brief history

The Panamanian Association for Sustainable Agriculture and Natural Resources APASAN was created in January 1997, by 20 professionals mainly experienced in agriculture and NRM. Initially, the purpose was: "*to contribute to the improvement of human livelihoods in harmony*

with the environment through the implementation of appropriated development models"; and the general objective was: "*to deliver conceptual and practical tools that allow for the satisfaction of fundamental needs for the development of agriculture while preserving the environment*" (APASAN, 2000:59).

APASAN considered its most important function to be: "*research and development of appropriate technologies, training in agriculture and NRM, promotion and dissemination of agricultural and environmental information, support to other NGOs in organisational related issues and project execution*" (*ibid.*).

Since 1999, APASAN is one of the NGOs that participated in the implementation of the Rural Poverty Project, which is funded by the WB and co-ordinated by MIDA. The role of APASAN in this project as its "*shadow executor*", is to *"facilitate* ***community self-management****, providing rural communities with methodological tools, technical assistance, advisory services, and training on strategic planning*". (MIDA & ANAM, 1999).

Another of APASAN's action areas is the CBMAP, in which it acts as *consultant* in environmental education, strategic planning and community organisation. APASAN also received funds from NATURA for implementing an agroforestry project. During the last three years, APASAN had implemented five projects at a total amount of 646,000 *balboas*.

The original organisational structure of APASAN basically consists of a general assembly of its members, a board of directors and the executive director. The executive director, who is the founder of APASAN and its leader, occupies the central role in all organisational activities. Hired consultants who are generally not members of APASAN co-ordinate the execution of the projects by the organisation's technical staff. In 2001, APASAN had a permanent staff of 10 professionals and 6 consultants. The financial secretary of the board of directors is in charge of the general administration of APASAN. Concerning institutional innovation, APASAN has participated in NATURA's ISP activities and since May 2001, is one of the ENGOs participating in the USAID's ISP. The participation in the USAID's ISP in particular has allowed APASAN to initiate a process of institutional change, of which the main characteristics are presented in the next section.

The process

The following elements of organisational identity were defined through a series of workshops, with the participation of the board of directors and technical and administrative staff.

Vision statement: *"APASAN is one of the main organisations committed to the promotion of self-management communities and the practice of agriculture according to the conservation of nature and biodiversity*".

Mission statement: "*to facilitate processes oriented to strengthen communities' self-management capacities through the creation of participatory spaces, interdisciplinary work, environmental education and the implementation of sustainable production models that contribute to human development through social, economic and environmental equity*".

Values and principles:

- "*autonomy to act independently of government entities and powerful groups;*
- *neutrality (free of political, religious, ethnic or geographical judgements) in the promotion of human sustainable development;*

- *commitment to the promotion of self-management development based on environmental values;*
- *promotion of equitable relationships in the use and sustainable exploitation of natural resources both at local and national levels.*
- *management of resources according to the organisational philosophy and Panamanian administrative and legal norms;*
- *participation of the whole civil society in activities towards self-management development;*
- *collaboration with and support to the state in its normative responsibility in the use of natural resources, to guarantee an enduring and healthy environment;*
- *stimulating of incentives for the active and committed participation of local communities in the solution of environmental problems*" (APASAN, 2001).

The main elements of organisational structure (see Figure 6.10) were defined with the support of USAID's ISP consultants (applying the MSI toolkit), and through the participation of APASAN representatives in the program's workshops.

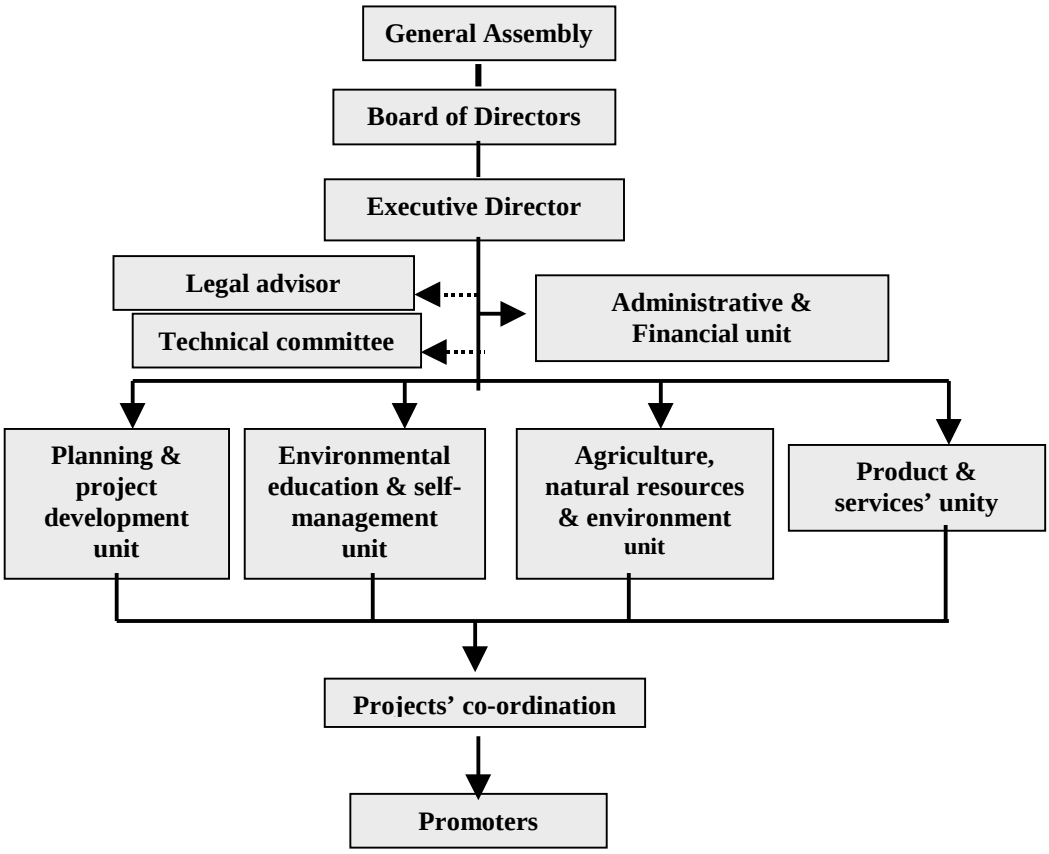


Figure 6.10 Organisational structure of APASAN

I had the opportunity to participate in one of the workshop with APASAN directors and staff in November 2001. After a short presentation about institutional innovation and the role of NGOs in RR&D efforts, participants worked in groups to agree on the issues that APASAN must develop or incorporate into its process of change, as well as the facilitating and restricting factors of institutional change (see Figure 6.11).

Figure 6.11 APASAN's strategic planning workshops

The following issues were discussed and agreed during the plenary session:

- *"incorporation of ethics into environmental conservation;*
- *recognition & valuing of staff talents and strengthening of their technical capabilities;*
- *orienting the change to a change of attitudes and to developing capacities for teamwork;*
- *establishing strategic alliances with other ENGOs to promote sustainable ecological and integrated human development;*
- *Implementation of strategic planning;*
- *practising an integrated gender approach;*
- *formulating and implementing a project that can contribute to integral social community development, to environmental sustainability, and to human development in harmony with nature;*
- *development of a strategy for the promotion and marketing of APASAN;*
- *implementation and institutionalisation of a M&E system of projects and programs; and*
- *improvement of the capacity of APASAN for negotiating with donors*" (This research).

Additionally, participants agreed on the following facilitating and restricting factors of institutional change in APASAN:

Facilitating factors:

- *raised environmental awareness and the role of environmental education;*
- *participation of APASAN in institutional strengthening programs;*
- *participation of APASAN in NGO networks; and*
- *existence of more training opportunities for NGOs.*

Restricting factors

- *increase of competition among ENGOs for resources;*
- *lack of recognition of the contribution of ENGOs to sustainability of natural resources;*
- *lack of administrative and technical capabilities for the management of change;*
- *lack of financial sustainability of APASAN; and*
- *lack of managerial capacity* (This research).

On the basis of information presented in this chapter, the main elements of theories of action for institutional innovation in ENGOs are summarised and compared in the next section.

6.6.3 Comparative analysis of theories of action for institutional innovation in ENGOs

The two case study ENGOs are different in many ways. While FUNDICCEP is a typical community-based organisation whose members are mainly horticulturists, APASAN is a professional intermediary organisation, whose members are agronomists and former civil servants linked to the agricultural sector. In addition, APASAN has a permanent personnel structure that includes hired technical staff and consultants.

In the next matrix (see Table 6.8), the dimensions of theories of action for institutional innovation in APASAN and FUNDICCEP are analysed and compared.

Table 6.8 Dimension of theories of action shaping ENGO changes

	FUNDICCEP	**APASAN**
Rationality	Communicative	Strategic (Instrumental)*
Scientific paradigm	Ego-centric (eco-centric)*	Eco-centric
Social worldview and image of organisation	Evolutionary Organisation as living organism	Economic Organisation as provider of products and services
Cultural worldview	Egalitarianism	Individualism (Hierarchy)*
Conducive policy framework	Environmental and agricultural sustainability	Privatisation of public services, community self-management, conservation of NR
Driving forces of institutional change	NATURA's ISP, organisational sustainability	USAID's ISP, demands, market, competition
Perception of the context	Complex, uncertain; it is possible to create harmony or equilibrium	Complex but manageable and programmable

* There are some elements of 'dominated" value frameworks that co-existed with the leading one. The former is shown between brackets.

There is a high degree of internal consistency among these dimensions within both change processes. Concerning FUNDICCEP, a communicative rationality, emphasising trust, honesty, mutual respect and ethics among the membership is consistent with an evolutionary social worldview and egalitarian cultural worldview. Regarding the scientific paradigm, some organisational principles, such as the transfer of technological innovations, organisational programs and management systems suggest that the eco-centric paradigm is being incorporated but ego-centric paradigm is still dominant.

Concerning APASAN, strategic rationality, an eco-centric paradigm, economic social worldview and an individualistic cultural worldview are quite consistent with each other and with the image of the organisation as "*provider of goods and services*". Yet, these dimensions coexist with instrumental rationality, techno-centric paradigm and hierarchical cultural worldview.

On the one side, FUNDICCEP is acting within the framework of growing environmental awareness at national and global levels. The operational context, mainly confined to the La Amistad biosphere reserve and its buffer zones, is perceived as dominant, complex and uncertain. Nevertheless, the members have a strong belief in the possibility of building harmonious relations among stakeholders and with nature, towards a more sustainable agriculture and environment. Other ENGOs are seen as partners and allies.

On the other side, APASAN is acting within a context characterised by the privatisation of public services, in which efficient and effective demand-driven organisations have a better chance of survival. Therefore, the context is perceived as competitive and complex, but programmable and manageable through the application of methodological tools for planning, monitoring and control. Other ENGOs are seen as competitors rather than as partners.

It is clear that both change processes are influenced in different ways by the ENGOs' participation in institutional strengthening programs. These programs and the perceived changes in their context are the most important external driving forces of their institutional change processes. Internally, the search for competitiveness, effectiveness and efficiency of organisational processes drive APASAN to change. In the case of FUNDICCEP, networking and the search for sustainable environmental efforts are the most important internal driving forces.

The elements of organisational *praxis* in Table 6.9 are clearer with regard to the differences between the two organisations, and confirmed the internal consistency among them as well as with those presented in Table 6.8.

Table 6.9 Organisational *praxis* for institutional innovation of ENGOs

Organisational practices	FUNDICCEP	APASAN
Type of change practised	Incremental, adaptive, reactive changes, focused on establishing alliances	Transformational, reactive changes focused on client, partner and competitors
Way of learning about institutional change	Interactive collective "learning by doing", single-loop learning	Imitation of benchmark, adoption of external recipes, single-loop learning
Facilitation of institutional change	External facilitator, acting as catalyst of internal initiatives	External advisor, top-down directives, central role of top leader and advisors
Configuration for change	Network-like, learning community	Hierarchical, bureaucratic structure
Management model of institutional change	Externally constrained management model based on decision-making by consensus	Personal management model
Participation of internal and external actors	Internal commitment to participation; no external participation	Internal participation by convenience; no external participation
Development of strategies for institutional change	Multidimensional perspective, interactive, the environment is the key factor	Instrumental, rational planning
Time orientation of changes	Long-term orientation	Medium-term orientation

In APASAN, it is possible to perceive some tensions in the internal participation within its change process. What I call *participation by convenience* here reflects the fact that most of the technical staff is interested in those changes that have the potential to safeguard their employment. Beside this, the board of director staff is interested in strengthening APASAN as an enterprise that can contribute to their personal sustainability in the future. The creation of a strong hierarchical bureaucratic structure is also a disturbing element despite the fact that this structure is not yet functioning.

In the case of FUNDICCEP, commitment and a sense of belonging motivate the participation of members in the institutional change process. An interesting element is the role of the external facilitator, who is in this case personally committed to developing and strengthening the conceptual and methodological autonomy of ENGOs.

6.7 Conclusions

Returning to this chapter's research questions, the preceding discussion in previous section illuminates some possible answers.

Research question 1: What kinds of organisational and institutional changes did ENGOs recently implement?

The great majority of reported changes in section 6.4 relate to the organisational dimension of ENGOs. For example, changes in products, services and processes. Many reported changes have to do with the adoption of strategic planning, PM&E systems and the incorporation of participatory approaches to decision-making. A few changes are related to the institutional dimension, such as the adoption of theoretical approaches that have the potential of affecting the organisational mode of interpretation and intervention. Nevertheless, as was stated above, there is no evidence that this is happening. Moreover, when new approaches are used to accomplish the organisational mandate, they are not applied towards institutional innovation of ENGOs. The only exception is the strategic planning approach that is used widely by many organisations, both for community support and for institutional innovation.

The economic worldview is predominant for implementing most organisational change. Consequently, the images of organisation that predominate are those of the organisations being a "*provider of products and services*" and being a "*market agent*", which influences the kinds of changes that will be implemented. In fact, the ENGOs reported changes that reflect the predominance of adaptive, instrumental types of organisational alterations, responding to perceived funding opportunities and donor requirements, with little preoccupation with the institutional dimension of the organisation.

Research question 2: What are the theories of action that inform the institutional innovation processes of ENGOs in Panama?

The analysis and comparison of different dimension and elements of theories of action reveal that some elements of economic theory of action are the most influential among those ENGOs that are acting as "*project executors*" and "*contractor*".

In addition, it is possible to find some elements of evolutionary theory of action such as the perception of the environment as dominant, the view of change as an adaptive process along stages or cycles of an organisation's life, and the focus on organisational renewal through self-organisation and self-management. For instance, with regard to the scientific paradigm, this

might be a case of shifting from an ego-centric to a holo-centric paradigm (from quadrant IV to quadrant III), without passing through a techno-centric and eco-centric paradigms (see section 1.3, in chapter 1).

Research question 3: How are institutional innovation processes of ENGOs affected by the theories of action of the donors and facilitators who fund and support them?

From the information presented in this chapter, it is clear that change processes in ENGOs are influenced in different ways by the theories of action of donors and by the institutional strengthening programs in which they are participating.

One way of influencing ENGOs' institutional change is by referring to functions that they must perform, and approaches that they need to practise in order to receive funds or to participate in support programs.

- In the case of APASAN, the change of purpose, from "*improving human livelihoods*", to "*strengthening community self-management*" has been influenced by the theory of action of the MIDA - WORLD BANK rural poverty project.
- During the strategic planning of FUNDICCEP the shift in the purpose from "*integrated community development*" to "*appropriated integrated development of Chiriqui Viejo river watershed*" is more in line with the objectives and funding priorities of the NATURA Foundation.

On the other side, the donor's theory of action for project PM&E and the facilitation of community development and RRM play essential roles in shaping not only what ENGOs do, but more importantly, their mode of interpretation (or how they think about what they do).

- Some organisational values and principles were translated directly from USAID's ISP to APASAN. For instance, the instrumental mechanistic orientation of this program has purposely avoided the debate about the mode of interpretation and theory of action for RRM while requesting of ENGOs to be neutral (free of ideological and geographical judgement), all the while promoting USA values, interests and objectives within the PCW.

I will return to the ENGO case in chapter 8 in which the three case studies are synthesised. I conclude this chapter with the following remarks:

- The analysis of FUNDICCEP's process of change shows other organisational practices, such as interactive learning, networking and establishing learning communities. These practices together with a communicative rationality, a evolutionary social worldview and an egalitarian cultural worldview should be considered as constituents of another theory of action that is emerging, though not yet well-defined.
- The diversity of approaches for institutional innovation embraced by the consultants that participate as facilitators of NATURA's ISP is one of its strengths, while, at the same time providing the option to the ENGOs to choose their preferred approaches without being forced by the sponsor.

Chapter 7. Praxeology of Institutional Innovation for Capacity-building of RR&D Organisations: The case of the ISNAR New Paradigm project

7.1 Overview

The International Service for National Agricultural Research (ISNAR)[42] "New Paradigm" project (NP project) is a social experiment, a research-based service aimed at generating knowledge and facilitating context-based institutional changes in Latin America, to strengthen the institutional sustainability of RR&D organisations. At the regional level, the project has not only supported institutional change processes, but has also innovated itself. Working with pilot case organisations gives the project the action research opportunity to reconfigure its theory of action for capacity-building of RR&D organisations, and to share newly generated insights with the active participation of local talents.

This chapter aims to reconstruct the institutional innovation process of the NP project. After introducing the case study design, the timeline of the ISNAR capacity-building projects in LAC will be presented. Then, the negotiation and implementation of the PM&E project, as well an analysis of the construction process of its theory of action will be discussed. Next, the experience of the NP project developing a new theory of action for capacity-building of RR&D organisations will be presented, followed by an analysis of the results of this research, regarding factors that affected the institutional innovation process and the lessons learned by the participants. Then, the theories of action of the PM&E and the NP projects are summarised and compared. Finally, the main conclusions and remarks concerning this case are presented.

7.2 Research design

The general aim of this doctoral research is to better understand the processes by which theories about the management and facilitation of institutional innovation are generated, reconfigured and appropriated by participant actors. Specifically, the objective of this case study is to reconstruct and interpret the changing nature of the struggle and negotiations concerning the NP project's theory of action for capacity-building of RR&D organisations.

7.2.1 Research questions

The following research questions will guide this case study:

1. How do change agents develop and deploy an alternative theory of action in such a way that they can overcome the limits imposed by the mainstream theory of action?

[42] ISNAR is one of the 16 international centres supported by the Consultative Group on International Agricultural Research (CGIAR). ISNAR "*seeks to contribute to the generation and use of knowledge that fosters sustainable and equitable agricultural development. ISNAR's mission is to help bring about innovation in agricultural research institutions in developing countries to increase the contribution of research to agricultural development for the poor*" (ISNAR, 2003).

2. How does institutional innovation in the NP project reflect the contradictions of the *change of epoch* and the development of a new paradigm of international co-operation for capacity-building in RR&D interventions?

7.2.2 Research methods and techniques

Over a period of four years, I followed and studied the project's progress through participatory action-reflection. During those years, the project held five regional workshops involving the participation of regional and national facilitators, managers of RR&D organisations, representatives of governmental and multilateral agencies and especially invited resource persons. Since March 1996, I joined the project as an associated professional. I have participated in all the projects' regional workshops and have written several reports on the process of collaboration with pilot case organisations. Additionally, I have co-authored four project publications related to the management of institutional change. Having started my doctoral study in April 1999, I decided to continue participating in project activities and to design a research project with a case study about the NP project's own innovation process.

Interpretative content analysis of project documents: Analysed documents include published project training materials, published and unpublished workshop reports, synthesis documents of group discussions, and internal periodical reports to ISNAR authorities and donors.

Interviews with key informants: A semi-structured questionnaire (see Annex 4) was elaborated and used as a guide during the interviews with key informants (project management team and ISNAR directors in The Hague). Another set of guiding questions (see Annex 5) was used during the interviews with NP project regional and national facilitators. A total of 19 interviews were accomplished.

Group discussion and peer review: The main findings of the case study were presented and discussed in a reflective feedback workshop with the NP project team of regional facilitators. During the workshop, I made a presentation on the institutional innovation process as well as the main research findings, followed by a plenary session for discussions. The participants then worked in groups to agree on factors and lessons and presented their conclusions in a plenary discussion. The results of these workshops were incorporated into the research report. Finally, my 'peer facilitators' of the New Paradigm project reviewed the manuscript of chapter 7 and made comments and suggestions that were fully or partially incorporated.

7.2.3 Timeline of ISNAR capacity-building projects in LAC

Between 1991-1998, ISNAR implemented the Strengthening Planning, Monitoring and Evaluation in Agricultural Research Management in Latin America and The Caribbean project (PM&E project). The ISNAR PM&E project was implemented in two phases (see Figure 7.1.). From the second phase, the regional office of the project was created in LAC and a manager was hired to lead the project activities.

In1998, ISNAR maintained the project office and team operating with its own resources, while searching for funds for the New Paradigm project (1999-2001). The recommendations from the project's external evaluation in 1997 and the growing demands expressed by managers and leaders from Latin American agricultural S&T organisations throughout 1998 pointed to a single major focus for the NP project: *the strategic management of institutional change and innovation*. In 1999, the project continued its activities as ISNAR New Paradigm project (NP project).

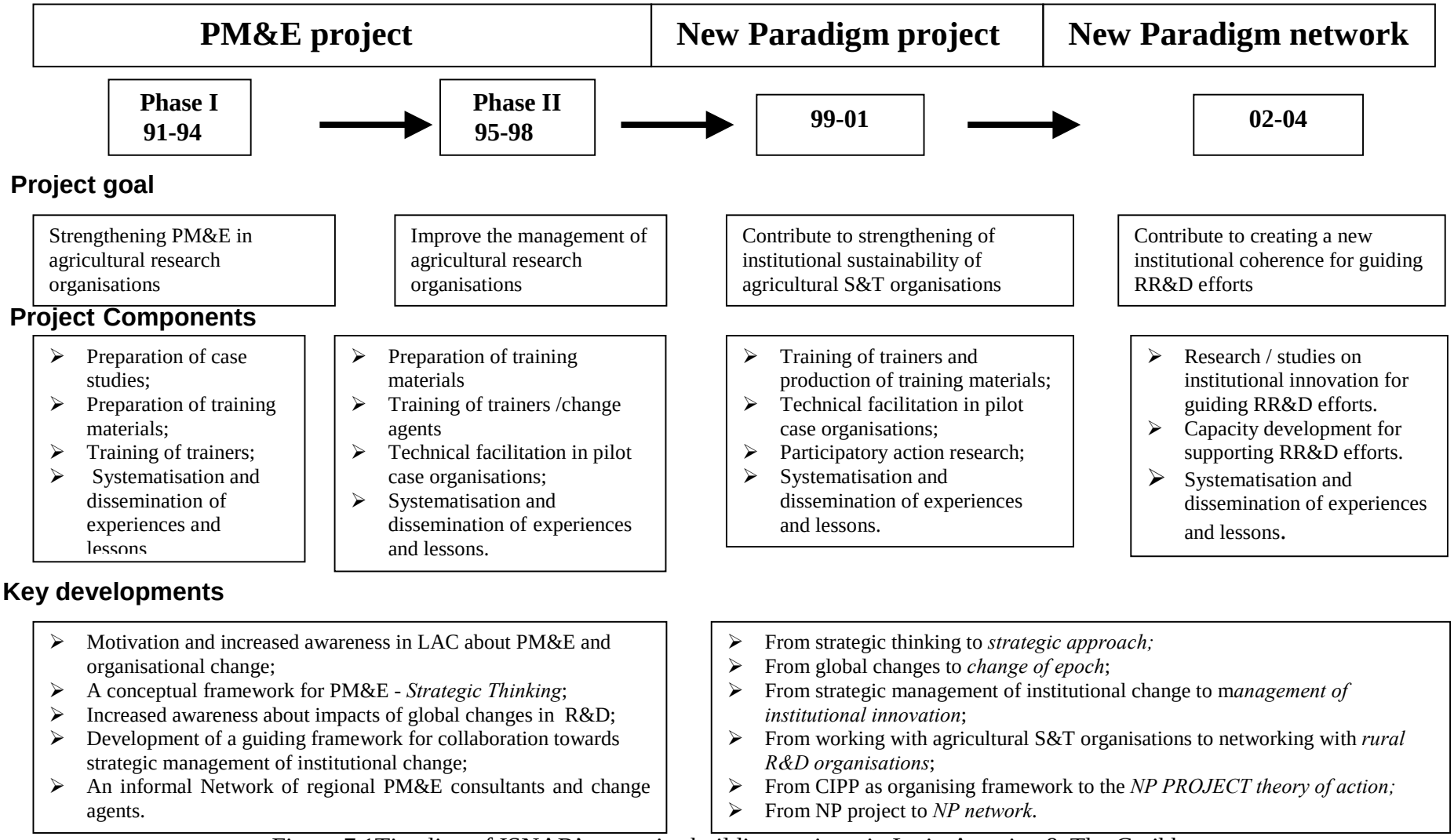


Figure 7.1Timeline of ISNAR's capacity-building projects in Latin America & The Caribbean.

In the 2002, the second phase of the NP project started: The New Paradigm network. The network is to: "*facilitate the linkage among (public, private, and not-for-profit) rural R&D organisations and their stakeholders, by creating an open, negotiated space for social learning. These actors should be able to locally and jointly interpret and manage the on-going change of epoch and to implement strategies for getting out of old rules, which have generated widespread vulnerability, and for practising negotiated new premises towards sustainability*" (ISNAR, 2001b:2).

7.3 The ISNAR PM&E project

ISNAR's PM&E project originated in a 1990 meeting convened by IDB and the Interamerican Institute for Co-operation on Agriculture (IICA) to identify priorities for CGIAR centres in Latin America. At this meeting, national research leaders asked ISNAR to provide management training, with a particular emphasis on research program planning and management. That year, ISNAR submitted a project proposal to IDB that: "*seeks to develop a balanced program of research, advisory service and training which respond to the needs of national agricultural research systems in Latin America*" (ISNAR, 1990:3).

7.3.1 Negotiation of the PM&E project proposal

From Horton's[43] account of his field experiences building capacity in PM&E (Horton, 1999), his personal communication and the reading of the original proposal (ISNAR, 1990) and the final agreement, ISNAR-IDB (ISNAR, 1991), it is clear that through the negotiation process with the IDB, the proposal was radically changed.

The original proposal was framed under the "*emerging paradigm of participatory action-research (PAR). The project is Participatory, in that staff members from national agricultural research institutions and from ISNAR will be co-responsible for all activities. It is action-oriented, in that one of its central goals is to reform on-going research programs. The project also has a strong research component, in that it is designed to advance world knowledge of agricultural research management and institutional change processes*"(ISNAR, 1990:2). In addition, the following core guiding principles were outlined:

- ***Linking of functions****: linking monitoring and evaluation activities directly to program planning.*
- ***Value of diversity***: according to this principle, the proposal explicitly rejected a "*transfer of technology approach";* instead, it was intended to *"employ management principles and previous experiences to develop with NARS' leaders specific approaches and tools that meet the need and resources constraint of each participating country program.*
- ***Focus on institutional development****: 'learning by doing' in which staff members of NAROs and ISNAR jointly apply management principles, approaches and tools in the diagnosis of problems, planning, and the implementation of institutional changes.*
- ***Participatory Action Research****: project implementation will involve a combination of research, action and training (ibid.:3).*

[43] In early 1990, Douglas Horton was hired by ISNAR to work on Monitoring & Evaluation of Agricultural Research. He had previous experience in Participatory Technology Development, while working as the head of the social sciences department of the International Potato Centre (CIP) in Peru. He was commissioned to write a proposal focused on the regional demand for strengthening the PM&E of agricultural research in LAC.

The proposal requested financial support for 1.6 million US dollars over a three-year period. After it was submitted, ISNAR heard nothing for several months, until Horton received a phone call from the Bank officer responsible for funding to the CGIAR centres. This officer, referred to by Horton (1999) as Mr A, informed him that the Bank was interested in supporting the PM&E proposal, with certain necessary changes:

- *The budget would have to be reduced to under US $ 700,000.*
- *The project would have to be implemented within an eighteen-month period.*
- *The project would have to focus on regional workshops and training; research should not emphasised.*
- *Testing of new PM&E methods in NAROs could not be included, since the funding available was for regional activities.*
- *The project should be 'self-standing', because future funding for an additional phase was unlikely* (Horton, 1999:161).

Horton wrote that he was shocked upon receiving the IDB conditions and that he *"proposed that we elaborate the 'program logic' behind our proposal, in order to convince Mr. A that capacity-building takes time. If he did not understand this and accept the PAR approach, we should look for funding elsewhere*" (*ibid.*:161). Despite Horton's interest in maintaining the proposal element that he thought were essential, ISNAR accepted the conditions of the IDB with regard to the PM&E project and made the requested changes[44].

In an attempt to influence the final version of the agreement, after the proposal had been accepted by the grants committee, Horton visited Mr. A in Washington. According to Horton, Mr A argued that both the research and needs assessment components were unnecessary and finally stated that: "*if you insist on these changes, you will have to resubmit your proposal next year*" (*ibid.*:162). Confronted with the impossibility of maintaining the original proposal, Horton proposed to ISNAR management to "*withdraw our proposal. But they didn't agree*"(*ibid.*).

By the time it was finally approved in October 1991, the original twelve-page proposal "*had been reduced to a four-line statement of purpose and a twelve-line description of activities: over a period of eighteen months, the projects would analyse the status of PM&E in four organisations; prepare practical guidelines for improving PM&E; improve knowledge on this topic among research leaders, through regional workshops; and disseminate information on PM&E to middle-level managers, through sub-regional training events. The approved budget was 690,000 US dollars*" (*ibid.*:163).

In fact, the original proposal was internally consistent (coherent) in itself, but lacked correspondence (external consistency), not only with IDB's collaboration mode and funding policies but with ISNAR's leading intervention mode. As Janssen (2002) has pointed out, ISNAR's theory of action "*was based on the 'DPI' paradigm, which stands for 'Diagnosis-Planning- Implementation'. The DPI paradigm starts from the point of view that the research organisation or the country under review is a type of patient and that the ISNAR staff working with it are types of doctors. The doctors establish a diagnosis, use the diagnosis to develop a plan of action, and afterwards facilitate the implementation of the plan.* (Janssen, 2002:1).

[44] According to Horton, this negotiation process was conducted by telephone with a person who was ISNAR's project development officer at that time (Horton, 1999).

In the final project document, approved in late 1991, the general objective of strengthening PM&E in the region's agricultural research organisations was to be achieved through the: "*analysis of the experiences of national agricultural research services by means of case studies, the preparation of guides, and the dissemination of the planning, monitoring and evaluation practices at the operational level for research managers and directors*"(ISNAR, 1991:7). As the implementation of the project evolved the PM&E management team was able to extend the work plan according to the field's dynamic and to negotiate financial contributions with others donors. As we will see in the next section, the implementation of the first phase involved five donors, and financial resources for an amount of 1.741 million US dollars (see Table 7.1).

7.3.2 Implementation of the PM&E project

During its first phase (1991-1995), the PM&E project carried out 13 case studies to identify the "*state of PM&E in agricultural research organisations in the Americas*". On the basis of these studies the project developed conceptual and methodological '*training publications*' for designing and implementing Integrated PM&E systems, training trainers in PM&E related topics and sharing the resulting conceptual and methodological issues through sub-regional workshops (see Table 7.1).

In its second phase (1995-1998), in addition to continuing the generation and sharing of training publications and training of trainer activities, the project supported institutional change processes in pilot case organisations (SINCyTA - Cuba, IDIAP - Panama, FONAIAP - Venezuela and MAG - Costa Rica). The impact of the project's first and second phases was evaluated through 1998-1999 and the results were published in the ISNAR series: "*Evaluating Capacity Development in Agricultural Research Management*". The evaluation studies (five in total) indicated the following major project contributions:

- to improve management knowledge and skills;
- to strengthen management training capacity;
- to enhance professional capacity for managing organisational change, particularly in the pilot case organisations; and to develop capacities for agricultural research management, especially by offering principles and tools for improving project formulation and management.

The authors of the project evaluation drew lesson that may be of use for improving the design and management of future capacity development projects:

1. "*Intended beneficiaries should play central roles in designing and managing capacity development efforts.*
2. *Capacity development programs should articulate and test their underlying theories and assumptions.*
3. *Capacity development programs should focus their attention on organisations that are committed to change.*
4. *Capacity development programs should go beyond providing inputs to facilitating change processes.*
5. *Capacity development programs need to work simultaneously on many fronts.*
6. *Capacity development programs should adapt themselves to the needs and circumstances of the organisations they support, not vice versa.*
7. *Integrating PM&E is crucial for promoting individual and organisational learning and improvement*" (Horton *et al*., 2000:xvi).

Table 7.1 Activities, outcomes and key participants in the implementation and funding of the PM&E project

	PM&E (Phase I)	**PM&E (Phase II)**
Main activities	10/91 ISNAR- IDB contract signed. 02/92 The project started 06/92 Planning workshop (Bogotá, Colombia) 10/92 Workshop "PM&E in The Americas" (Mexico) 05/93 Workshop to Train Trainers (Cali, Colombia) 08/93 Sub-regional workshop (Motevideo, Uruguay) 09/94 Sub-regional workshop (Ibarra, Ecuador) 04/94 Sub-regional workshop (Kingston, Jamaica) 06/94 Final Evaluation Workshop (Turrialba, Costa Rica).	08/95 Planning workshop (Quito, Ecuador) 03/96 Regional workshop "Training of Trainers/Change agents" (Maracay, Venezuela) 07/96 Sub-regional workshop (Panamá) 10/96 Sub-regional workshop (Maracay, Venezuela) 11/96 Sub-regional workshop (Viña del Mar, Chile) 02/97 Mid-term Review workshop (Quito, Ecuador) 10/97 Regional workshop of SDC (Quito, Ecuador) 12/97 Final Synthesis & Evaluation workshop
Main Outcomes	1 Sourcebook on PM&E (Horton *et al*., (eds), 1993) 13 Case Studies on PM&E in The Americas 1 Synthesis book of case studies (Novoa, & Horton, (eds), 1994) 4 Training Modules - Strategic Approach (Gálvez *et al*., 1995), Strategic Planning (Borges-Andrade *et al*., 1995), Monitoring in Agricultural Research Management (Bojanic *et al*., 1995) and Evaluation Agricultural Research Management (Granger *et al*., 1995) 18 Trainers of PM&E trained; 101 Research Managers trained.	2 Training Modules (Strategic Management of Institutional Change (Diaz *et al*., 1997) and Management Information Systems (Bolívar *et al*., 1997) 2 Generic Framework (Design of an integrated PM&E system (Granger *et al*., 1997) and Factors of project Competitiveness (Aued *et al*., 1997) 17 New PM&E trainers; 71 Professionals trained in PM&E 562 Professionals trained in PM&E principles and processes 976 Professionals trained in PM&E
Directly involved R&D organisations and their relative share in the funding in (%)	EMBRAPA and University of Brasilia (Brazil), INTA (Argentina), INIAP (Ecuador), INIA (Chile), INIA (Uruguay), IBTA (Bolivia), CORPOICA and PROCADI (Colombia), INIFAP (Mexico), MAG (Costa Rica) and FONAIAP (Venezuela) **Overall share of funding 14.36%**	EMBRAPA and University of Brasilia (Brazil), INTA (Argentina), INIAP (Ecuador), INIA (Chile), CORPOICA (Colombia), INIFAP (Mexico), MINAG (Cuba), IDIAP (Panama), FONAIAP (Venezuela), MAG (Costa Rica) and MAG-DIA (Paraguay) **Overall share of funding 16.80%**
Donors and their relative share in the funding in (%)	ISNAR (27.63%), IDB (39.63%), IDRC (11.49%), SDC (3.45%), CTA (2.18%) and IFAD (1.26%). (100% = 1.741 million US dollars)	ISNAR (30.68%), IDB (25.85%), SDC (25.33%) and DANIDA (1.34%). (100% = 2.321 million US dollars).

Source: Elaborated on the basis of project and other ISNAR documents.

7.3.3 Theory of action of the PM&E project

As was stated above, one of the consequences of the negotiation process with the IDB in 1991 was that the original proposal was modified. Therefore, the project was re-programmed according to the TOT (rather than a PAR) approach in which specialists in PM&E transfer their own knowledge and the information generated by the case studies to the 'beneficiaries' in the NAROs. The case studies carried out in the first phase had to be used *"as instrument for training activities of external PM&E consultants"* (ISNAR, 1992a:126).

During the first and second phases, the PM&E project its intervention took place based on the rationality that: "*the PM&E systems contribute to the efficiency and effectiveness in decision-making on the allocation of human, physical and financial resources and create the management capacity within agricultural S&T organisations*" (Cheaz *et al*., 1995). In addition to being reductionistic, this linear, deterministic way of thinking and acting was influenced by the rationalist perspective of learning, narrowly defined as just a problem-solving activity (*single-loop learning*).

Moreover, when looking for experiences in LAC, the project team deliberately tried to avoid conceptual and theoretical reflections about the subject at stake. This is clear in the content of the "*Guidelines for speakers, moderators, reporters, working groups and round table participants*". Among other "*practical instructions*", they pointed out that "*we are not interested in general concepts, theories or how PM&E will be or should be done. We want to know what the experiences in PM&E are and how to improve it*" (ISNAR, 1992a:142).

As the project implementation evolved, the participation of regional professionals encouraged the project management team to move in the direction of action research and learning. During the workshops, the representatives of LAC S&T organisations (especially from EMBRAPA, who had experiences managing their very complex process of institutional change) proposed an alternative mode of intervention for the project. The main idea was to break with the traditional mode of collaboration in which the external consultants or advisors took an active, expert role, and local staff a more passive, receiving role.

On the one hand, as explained above, the project team in the first phase was interested in "*practical experiences*" more than in theoretical or conceptual reflections. Indeed, in the "PM&E in The Americas" workshop (Mexico, 10/92), one of the participants suggested that the project could make a real contribution if it promoted and reinforced the "*conceptual and methodological autonomy of involved local professionals*", by focusing on supporting organisational change processes in S&T organisations, and not only on strengthening PM&E (ISNAR, 1992b).

In addition, to ensure information sharing, training relevance, and capacity development, it was suggested that a core group of regional trainers should be educated to train local trainers. These local trainers replaced the 'PM&E expert consultants' that the project had proposed for "*delivering the training*" to S&T organisations.

Faced with the demands of national S&T organisations, the project included the training of trainers' workshops and the training of a "*core group of trainers*" in educational methodologies (see Figure 7.2).

The expected output of the whole process of training was expected to be a "*Resource Bank of Trainers and a set of tested methods and training materials ready for collaboration and dissemination*" (ISNAR, 1992b:96).

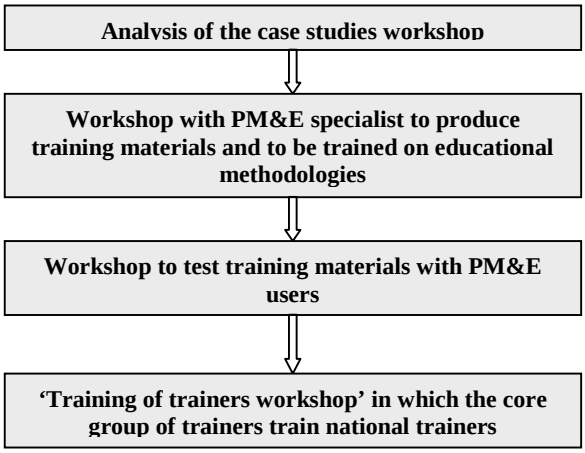


Figure 7.2 Training strategy of the PM&E project. (based on ISNAR, 1992b)

CIAT's training unit, which has developed a methodology for producing agricultural training materials (mainly designed to transform technical information generated by the NAROs, and CGIAR centres into training materials to train extension agents) was hired to support the training of the core group of 'PM&E experts'. According to CIAT's instructional planning approach (Zapata, 1992), agricultural experts produce modules with a set of '*instructional sequences*' that serve as training materials to be used to train other trainers. Specifically regarding the PM&E project, the aims of the workshop with PM&E experts were:

- *to develop knowledge, abilities and attitudes to plan, direct and evaluate training events; and*
- *to elaborate training materials administration of agricultural research* (ISNAR, 1993:2).

The main guiding premise of the "*instructional planning approach*" is based on a pedagogy in which adult learning is considered to be independent of teaching efforts and which suggests that the adult learner should determine the goal, content and methods with which s(he) wants to learn. Under this premise, instructors are "*planners of learning experiences*" (Granger, 1997:2).

Participatory training, as the main strategy of the project, aimed: *"to improve in* (the national and regional S&T organisations) *the capacity to diagnose and solve PM&E related problems"* (ISNAR, 1992a:3). This strategy defined participation as: the way in which "*consultants and professionals from the NARS and organisations from the region actively participate in the preparation of training materials and in training workshops*" (ISNAR, 1992a:4). Through this form of participation, PM&E 'experts' had to produce training materials, without questioning the core rationality, assumptions, and strategies of the PM&E project.

Regarding the project's mode of interpretation, on the other hand, a particular tension rose between the management team and local actors from the very beginning about the need for a conceptual framework integrating the proposed PM&E changes within a broader perspective of organisational change. While the management team was emphasising the importance of technical coherence among the principles and processes of PM&E, the regional actors were concerned about conceptual coherence among alterations on PM&E, organisational and contextual changes. For instance, during the workshop to train trainers (05/93 in Cali, Colombia), two different outlines of the content to be developed in "*Module 1*" were presented and discussed. Finally, the

participants decided to adopt the one proposed by regional participants instead of following the project team's proposal. At the end of the workshop, the Module 1 maintained the originally suggested title "*Principles and Processes of PM&E*", but the content corresponded to '*The Strategic Approach to Agricultural Research Management*', as it was finally published in 1995. This incident was registered in the workshop's 'poetic report': "*El grupo del modulo uno / nunca de facto empezó / sin principios y sin procesos / X. lo abandonó*" (ISNAR, 1993:65) [45].

Using a participatory action-learning perspective to produce training material the PM&E project not only attained its objective, but creatively incorporated new conceptual and methodological issues that had not been originally contemplated. This is the case of strategic management that became a central theme of the project proposal. The principal features of the strategic management were:

- the guiding hypothesis that the "*rise and fall of R&D organisations is strongly associated with the rise and fall of the national development model*" (Gálvez *et al*., 1995).
- The concept of organisational sustainability as the joint effect of three essential components, as expressed in the Triangle of Organisational Sustainability (see Figure 5.2). The three interrelated dimensions are: an organisational project (mainly a strategic plan), the organisational competence to carry out that strategic plan and the credibility reached from its interaction with the external operational context.
- The development of strategies as a key feature of the change process; strategy is conceptualised as the logical combination of action, factor and actors to achieve a goal or long-term vision.
- The key role of top managers of organisations in change processes. The strategic intention consists of the ideal combination of the following elements: a futurist view of organisation; the conviction that it is important to have a strategic plan that can turn this vision into a reality; a strong desire that this strategic plan will succeed; the political will to make viable the formulation and implementation of the plan; and the courage to assume the risk underlying an initiative of this type and magnitude.
- The context-centred approach for the SWOT analysis focuses on the market and the demands of clients, users and partners. Methodologically, this means: to start identifying the opportunities and threats in the context and then proceed with the internal organisational analysis to identify strengths and weaknesses with regard to already identified opportunities and threats;
- The long-term commitment of change process. By using specific techniques to build future scenarios and by applying the concepts and methods of strategic planning.
- Building a strategic culture, meaning the institutionalisation of strategic thinking, to achieve a flexible organisational behaviour that adjusts to changing conditions.
- Investment in strategic training as an "intelligent investment", that is applying resources to factors that transform other factors.
- Preferring collegiate decisions and promoting participatory change processes based on mutual responsibility, strong organisational legitimisation and commitment.
- Employing a holistic inter-disciplinary approach to explore the complexities of reality (*ibid*.).

[45] The 'poetic report' became a very informal, humorous and traditional part of the workshop's report, which was presented at the workshop's closure. As in this particular case, the poetic report registered the fact that the management team's proposal for Module 1 was discarded during the workshop. "*The group of module one / never in fact began / without principles and without processes / X. abandoned it"* (ISNAR 1993:65).

In addition to strategic management, the regional facilitators reconfigured the CIPP evaluating methodology into an organisational PM&E model. Originally, CIPP is an acronym that includes the first letters of four kinds of evaluation. "The **C** stands for context evaluation, which is a kind of needs assessment. The **I** represents input evaluation, which is a means of identifying and assessing competing plans. The first **P** denotes process evaluation, which assesses and guides the implementation of plans. And the second **P** refers to product evaluation, which involves assessing outcomes" *(Stufflebeam, 1983:140).*

The organisational PM&E model integrated within different decision-making levels the management of information on: the *context* or environment of research, the research *inputs*, internal organisational research *processes* and research *products* and impacts (Gálvez *et al*., 1995).

During its second phase, the project applied the CIPP model not only for the evaluation of project activities, but also as an organising framework for the "*project logic model*" (see Figure 7.3).

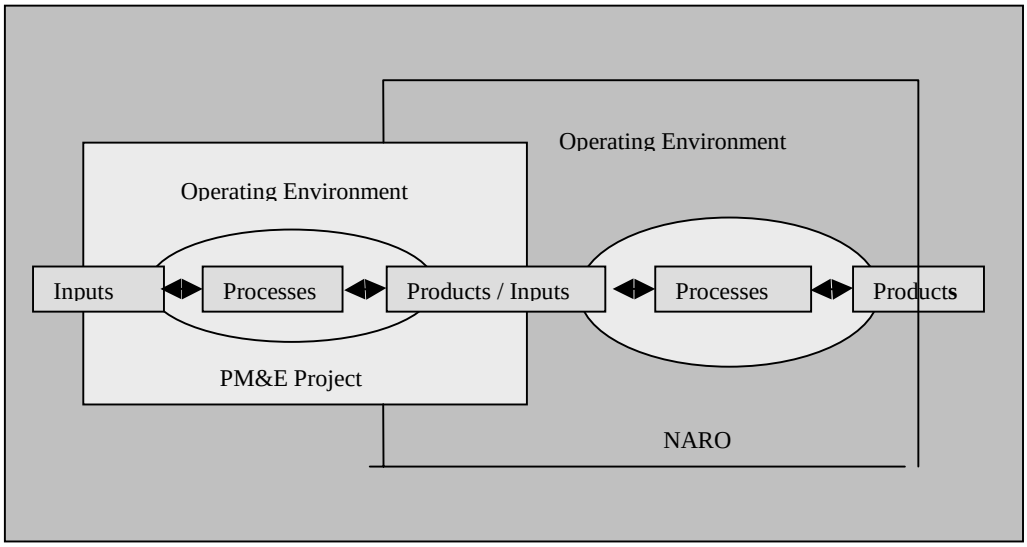


Figure 7.3 Project logic model: The PM&E project and the NARO as interacting production systems (Andersen *et al*., 1997).

This project logic model explains "*the process by which the project intended to affect national agricultural research organisations*" (Andersen, *et al*., 1997:104). Both the project and the NARO are represented as 'production systems' within an operating environment that employs inputs in a production process that generates specific outputs. The projects products and services (such as training materials, publications and advice on PM&E) are considered to be "*organisational technologies*" (Mackay & Horton, 2000:11), which affect the NAROs by influencing their operating environment, or by being used as inputs into NARO's production processes. The chain of impacts continues as the generated NARO's products or "*production technologies*" affect the farmers' production systems (*ibid.*:11). As Horton, *et al*. pointed out, the pilot cases served as "*testing sites for PM&E concepts and methods and provided practical experiences for enriching the project's training offerings*" (Horton *et al*., 2000:xvi).

The planning of the second phase was accomplished in a regional workshop with S&T organisation managers, who formulated a detailed project logical framework (Cheaz *et al.*, 1995). In addition, the project started to work with pilot cases. Soon after starting collaborating

with pilot organisations, the management team realised that the rigid, instrumental, managerial guidance offered by the logical framework was not useful for this kind of intervention.

The project team worked in a highly participatory and collaborative way with professionals from the pilot cases and carried out planning, negotiating and technical missions in the form of a one- or two-day workshop to attend specific demands of support from the local actors.

This planning-and-negotiation strategy replaced the traditional blueprint intervention. In this way, professionals in the region influenced the design and execution of the project. While the objective remained constant over time - institutionalisation of integrated PM&E systems -, the activities carried out to achieve them and the time schedule were frequently reviewed and revised to match emerging needs and opportunities.

The organisational reality in the pilot cases and the changes taking place inside and outside these organisations required patience and flexibility as opposed to a strict adherence to a preconceived work plan. One of the main reasons for extending the process of collaboration by one year in 1998 was the necessity of a participatory formulation of a strategic plan before the initiation of PM&E activities (see Box 7.1).

Box 7.1 **The PM&E project: social commitment or religion?**

During the project's mid-term review workshop in Quito (February 1997), ISNAR's program director at that time called the project a "*religion*" because of its theoretical and methodological coherence and the commitment of involved actors. In fact, the managers of the pilot case organisations and other participants in the workshop criticised this opinion and made clear that the regional actors considered the project a legitimate and valuable initiative towards a new management paradigm for agricultural research. Moreover, the managers of the pilot cases signed and sent a letter to ISNAR's General Director to express their political support to the project and requested from ISNAR the maintenance of the project activities in Latin America through 1998 when the donor's financial support was expected to finish. In addition, they offered a "space" to establish a permanent ISNAR regional office in one of the pilot case organisations. In the letter, the managers of the pilot case organisation stated: "*The collaboration process has been appropriate to our institutional reality, adapting its strategies based on our demands, helping to harness national human talents, and promoting the establishment of a new management paradigm based on the strategic management of institutional change*".

Source: "*Carta de los Directivos de los Casos Pilotos*" in Andersen *et al*., 1997:136.

The development of strategies within the PM&E project in its first and second phases followed a rational instrumental perspective in line with the 'planning school'. In its training materials, the project defined strategy as: "*a course of action involving a logical combination of actors, factors and actions chosen to reach a long-term goal or vision*" (Gálvez *et al*., 1995:61).

At the end of the PM&E project, some elements of its theory of action were made explicit. These include the above-presented *strategic management*, the guiding hypothesis and project frameworks for collaboration in capacity-building interventions.

Guiding hypothesis

"The rise and fall of development organisations is strongly associated with the rise and fall of development models".

Project frameworks

- ***"Ethical-philosophical framework****. The principle of principles for a collaborative project is to promote the development of, instead of development in organisations. This implies practising a collaborative model that transfers the art of hook-making, instead of transferring the fish or the hook. From this principle, others have been derived, such as: (i) building conceptual and methodological autonomy; (ii) promoting local active participation; and (iii) applying the authority of argument, instead of the argument of authority.*
- ***Conceptual framework:*** *Among other concepts, the project has developed and is validating the concept of institutional sustainability—the product of the never-ending negotiation between the goods and services an organisation provides and the needs, realities, aspirations and conflicts associated with the key social actors in the context relevant to the organisation.*
- ***Methodological framework:*** *To be consistent with the collaboration principle of principles that integrates its philosophical framework, the project has created a methodological rule under which all technical missions are carried out in the form of workshops.*
- ***Operational framework:*** *Among other practical elements, the project stimulates* ***"learning by doing".*** *As a practical consequence, the project cannot share any formula or recipe; only reference elements and frameworks; only interpretative questions, not true answers*" (De Souza Silva *et al*., 1999:7).

7.4 The ISNAR New Paradigm project

The co-ordinated effort of managers of S&T organisations and the project management team allowed the formulation of a proposal for NP project third phase and the development of a strategy to obtain its financial support.

7.4.1 Negotiation of the NP project proposal

The original idea was to submit the formulated proposal to FONTAGRO[46], as a multilateral regional project, involving agricultural research institutes from Colombia, Panama and Venezuela[47] and ISNAR.

This proposal was the result of a highly participatory process. First, the basic elements were discussed during the second phase's final evaluation workshop. In this workshop, the IDB's external evaluators suggested submitting the proposal to FONTAGRO[48]. Second, the proposal was formulated by the project team in line with the donor's requirements and negotiated with managers of IDIAP, FONAIAP and CORPOICA (the Colombian Corporation for Agricultural Research) during a special mission of the project leader to these organisations. In Colombia, the proposal was discussed with the president of FONTAGRO, who at that time was the general director of CORPOICA. Finally, the concerted proposal was sent to ISNAR headquarters to request institutional support.

In response to the regional request, the program director at that time expressed a very negative view of the management of the project and suggested replacing the proposal's subject (institutional sustainability) with *"(i) a Module on Operational Planning, or (ii) Integration between Planning and Budgeting Processes, or (iii) any other Management Support System*" (Program director's letter, 10/06/97).

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[46] Agricultural Technology Fund (see chapter 2, section 2.3.1)

[47] These three countries signed the FONTAGRO agreement and at that time had made the initial financial contribution to the FONTAGRO fund.

[48] The executive secretary of FONTAGRO at that time was one of the external evaluators of the PM&E project.

This suggestion by ISNAR's program director ignored the fact that the proposal had been the result of a negotiation process among regional actors and negated the determination and the political and ethical commitment of the NP project management team. In response, the project manager pointed out that "*none of the three themes have been demanded by the region, nor have they been considered as relevant by any important international co-operation agency. This is the reason why our project proposal still addresses the theme of institutional sustainability; unless ISNAR management decides otherwise*" (project manager's letter, 23/06/97). Finally, the general director of ISNAR gave the formal institutional support for the proposal's submission to FONTAGRO.

The executive secretariat of FONTAGRO rejected the NP project's proposal arguing that "*it was not innovative*" (De Souza Silva, personal communication). In fact, this was a political decision because the proposal was not even evaluated according to the established procedure.

Looking over the NP project's proposal it can be said that it was internally consistent, but that it lacked *correspondence* with ISNAR's and IDB's theories of action. Contrary to what happened in 1991, this proposal was not 'negotiated'. Without a doubt, this is not matter of 'competitiveness' in the sense commonly given to this concept in international co-operation, which emphasises the proposal's "*technical quality*" and its internal and external consistency.

Confronted with the rejection by the IDB-FONTAGRO and ISNAR's management opposition, the NP project management team decided "to break the rules" and sent the proposal to the Swiss Development Co-operation (SDC) without consulting ISNAR headquarters. The SDC considered that this was the "*most innovative proposal that the* SDC *had ever received in its history of collaboration*" (De Souza Silva, personal communication) and assigned 1.2 million US dollars to it implementation. In this way, how the SDC took over the position of major NP project donor. Thus, the participatory action-research component was included and the project scope of action was enhanced to support institutional change processes in other agricultural R&D organisations (universities and NGOs).

7.4.2 Implementation of the NP project

The change in the project goal from "*strengthening PM&E in agricultural research management*" to "*strengthening organisational sustainability through facilitation of institutional change processes*" brought up new questions and problems. Working with development problems that are in their very nature are changing problems, the NP project's facilitators realised (learned) that people do not solve development problems, they interpret and manage them in different contexts. Therefore, instead of being a problem-solving project, it needed to be transformed into a network for institutional innovation that would contribute to developing conceptual, methodological and cultural capacities, so that people could increase their abilities to interpret and manage development problems that interest them according to their own history and culture. As one of the local actors said: "*you do not need to find and solve problems that interest us. You would do better to help us create our own capacity to interpret and manage whatever problem that interests us*" (Inteviewee 40, this research).

Thus, the NP project's associated professionals started a collective effort to reconfigure the facilitation of training of trainer process. In addition to the changed project goal, because of financial constraints, the project could not continue hiring the CIAT training units to facilitate the production of training materials and the training of trainers' workshops. Therefore, the project's associated professionals accepted the challenge and took the responsibility of facilitating the process, but then also started discussing the process itself. As a result, a new

guiding framework was generated: the so-called "*collective construction and appropriation of knowledge*" (see figure 7.4.).

The never-ending process of construction and appropriation of knowledge is a reconfiguration of Kolb's learning cycle (see Figure 1.1) and incorporated principles of Freirean "*liberatory education"* (Freire, 1970). Indeed, Freire's concept of *knowing* as educational *praxis* in which reflection is informed by action and action is informed by reflection through democratic *dialogue,* underpin this framework (Freire, 1970). The process of interactive knowing happens as follows:

- *Exchange:* In the initial step, teams of selected participants with a very diverse background share their knowledge and experiences, establishing a *knowledge dialogue* with the eventual support of 'resource persons', literature and participatory methodology.

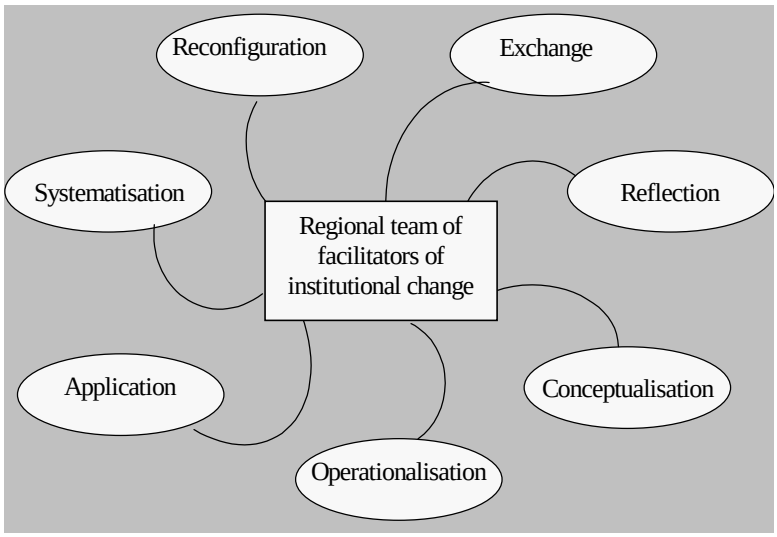

Figure 7.4 Collective construction and appropriation of knowledge (adapted from Sanin, 1984; and Cheaz *et al., 2001)*

- R*eflection:* Participants start making abstractions; a set of analyses aimed at comparing and relating the knowledge and experiences shared. Thus, they move from an instrumental exchange to a conceptual analysis. In this effort, they engage themselves in a sequence that goes from description to analysis, from analysis to interpretation, from interpretation to explanation, from explanation to synthesis, and from synthesis to evaluation.
- *Conceptualisation:* As a result of reflection, participants: (i) build concepts; (ii) generate syntheses to permit generalisations; and (iii) construct some theoretical units to help themselves to interpret, to explain, and to provide guidance to others.
- *Operationalisation:* Participants translate/codify the knowledge generated in the previous step into sets of methods and tools for facilitating the application of such knowledge.
- *Application:* Participants organise and manage the process of application of the knowledge generated in all previous steps.
- *Systematisation*. Participants systematise the experiences, impacts and lessons learned in the step of application in order to recuperate and formalise the transformed knowledge made possible by the application process.
- *Reconfiguration.* With this step, the whole creative circle restarts. First, actors who participated in the *Application* step exchange their knowledge, experiences and lessons

derived from the Application process. Second, they bring the knowledge, experiences and lessons gained up to an abstract level. Then they generate a synthesis to permit generalisations. Next, they update their methods and instruments. Finally, they go back to their organisations to disseminate and apply the validated, consolidated knowledge (Cheaz *et al., 2001)*.

A core group of professionals (approximately 60 professionals representing over 30 R&D organisations from more than 15 different countries) was involved in planning, implementing, reviewing, and evaluating project activities. There are two types of organisations associated to the NP project: (i) the "*pilot cases*", with which the NP project collaborates in their institutional change processes; and (ii) the "*collaborating organisations*", those that share their professional talents with the NP project to implement its regional activities. In the first case, "*pilot case*" organisations (PROINPA, FONAIAP, UCV, CIARA and SINCyTA) have committed themselves to assume all direct and indirect local costs, as well as the direct costs of the collaboration. Regarding for example, the technical missions to pilot cases, they pay the air tickets, ground transportation, lodging, meals, etc., for all international professionals, including project staff. If they send their professionals to be trained in any of the project training workshops they also assume the direct and indirect costs for their participation. In the second case, "*collaborating organisations*" (EMBRAPA, INTA - Argentina, INIFAP, IDIAP, CEDAF, MINAG) they have committed themselves to assume the indirect costs (salaries and benefits) regarding the participation of their professional talents during any of the NP project's activities (workshops, technical missions, etc.).

What is more important is that R&D organisations agreed to collaborate by allowing their professionals to participate in the NP project's events, including workshops lasting from a week to more than a month. Through group work, individuals increased their knowledge, skills, and abilities and also became more motivated. Over time, they developed teamwork skills and a sense of ownership over the project's goals and strategies. However, most "*associated organisations*" are already using the project's guiding hypothesis, principles, premises, as well as its technical contents and guiding conceptual and methodological frameworks for the management of institutional change, in order to build legitimacy and room for manoeuvre in their negotiations with national authorities. Many governments in the region are imposing institutional changes by Decree. Because of their collaboration plans with the NP project, these organisations are among the few to have an original and convincing institutional change proposal within their national context.

In addition, the project was innovative in that it established an action-research component for generating organisational knowledge through the systematisation of the project's experiences with the participating pilot case organisations. These inclusions allowed for qualitative institutional changes to be undertaken within the NP project. With regard to the PM&E project, the major changes were:

- From strategic thinking to *strategic approach* (see section 1.3.4 in chapter 1);
- From "global changes" to "*change of epoch"*;
- From strategic management of institutional change to m*anagement of institutional innovation*;
- From working with agricultural S&T organisations to networking with *rural R&D organisations*;
- From CIPP framework to the *NP theory of action;*
- From NP project to *NP network.*

The main activities carried out by the NP project and their major outcomes, as well as the participating organisations and donors presented in detail in Table 7.2.

Table 7.2 Activities, outcomes and key participants in the implementation and funding of the NP project

	NP project (1999-2002)
Main activities	02-04/99 Negotiating missions (Pilot cases) 06/99 Capacity-building workshop (Heredia, Costa Rica) 08/99 Consolidation workshop (San José, Costa Rica) 10/99 Team training workshop (Heredia, Costa Rica) 03/00 Knowledge-generation and theory-building workshop (San Jose, Costa Rica) 09/00 Systematisation of Experiences workshop (Brasilia, Brazil) 12/00 Review workshop (Cuba).
Main Outcomes	6 Reference books in the ISNAR series, Innovation for Institutional Sustainability: The institutional question (De Souza Silva, *et al*., 2001), Future (Castro *et al*., 2001), Context (Valle Lima *et al*., 2001), Strategy (De Souza Silva *et al*., 2001b), Participation (Salazar *et al*., 2001), Management, (Mato *et al*., 2001) 11 New regional Facilitators in Strategic Management of Institutional Change; 16 Facilitators trained 571 Professionals trained
Directly involved R&D organisations	EMBRAPA (Brazil), INTA (Argentina), INIFAP (Mexico) MINAG (Cuba), IDIAP (Panama), PROINPA (Bolivia), FONAIAP, CIARA and the UCV (Venezuela), PUCE, UCE and the FAO-DFC project (Ecuador), CEDAF (Dominican Republic), INTA (Nicaragua), WAU (The Netherlands), MSU (USA). **Overall estimated share of funding 25%**
Donors	SDC - Swiss (62.5%) and DGIS - The Netherlands (12.5%) (100% = 1.92 million US dollars)

The generation and appropriation of knowledge became a self-propelling dynamic that allowed the project's professional talents not only to promote and support institutional change processes within their organisations, but to transform and make explicit the NP project's theory of action for institutional innovation in RR&D organisations. The theory of action of the NP project is presented in the next section.

7.4.3 Theory of action of the New Paradigm project

The process of institutional innovation of the NP project happened under the communicative rationality: "*interactive construction of organisational capacities for the management of institutional innovation contributes to organisational sustainability*" (De Souza Silva, personal communication). This could occur because the project facilitates the R&D organisation's process of institutional change by building its internal capacity to strategically manage it, and by assisting the organisation during the period necessary to consolidate such a capacity.

The NP project consolidated a network of professional talents trained by the project in its conceptual and methodological frameworks for the strategic management of institutional change and innovation, and educated under its collaborative framework of capacity-building and its strategic approach to institutional sustainability.

The NP project held two workshops especially designed to get participants to reflect on the theoretical and methodological elements of its mode of interpretation and theory of action:

- Knowledge Generation and Theory Building (03/00 in San Jose, Costa Rica);
- Towards a New Coherence for Institutional Innovation in RR&D Efforts (10/01 in Heredia, Costa Rica) (see Figure 7.5).

Figure 7.5 New Paradigm project's workshop (2001)

The participation in these workshops of three "*international intellectual focal points*"[49] gave the regional team of facilitators the opportunity to gain insights into new perspectives on and approaches to institutional innovation, and to reconstruct the project's theory of action through sharing experiences, debating and networking.

As one of the regional facilitators put it, "*the project has become a space for construction of theories, conceptual, methodological and cultural frameworks as a result of the intellectual effort of its management team and its 'associated professionals'. The project has created this space for interaction with professionals from both within and outside the region who can act as intellectual focal points*" (Interviewee 44, this research).

The project has effectively contributed to personal and organisational capacity building. During the interviews with NP associated professionals the following statements were made regarding the project's contribution to personal and professional development:

- *"The NP project has made my mode of intervention more coherent, both in the professional and personal realms. The premises of the project have helped to extend my vision on the phenomena and events that are going on and stimulated my long-term preoccupation and commitment to my working context".*
- *"The interaction within the NP project has allowed me to find other answers and has impelled me to think about new questions*".
- *"The NP project has added something special to the years that I have been involved as an 'associated professional'. In addition, what I have learned and discussed have opened new intellectual avenues that I am still trying to deepen today".*

[49] The NP project invited three distinguished Professors: Niels Röling from Wageningen University and Richard Bawden and Lawrence Busch from Michigan State University to join the project as "international intellectual focal points".

- *"It has 'almost' been like doing a second PhD. I have had to read a lot, learn new concepts, approaches and paradigms, and use a vocabulary very different from the biological vocabulary I usually handle in my professional career. I believe, with great humility, that I am now more complete professional, because I have moved away from mechanistic thinking to more holistic thinking from which I still have much to learn"* (Different interviewees, this research).

In order to understand the dynamic of innovation, the project's theory of action and its search for institutional coherence and correspondence in RR&D interventions needed to be treated explicitly.

Thus, a review and comparison of different alternative theories and approaches to inform institutional innovation in RR&D organisations was made. This process led to the definition of the key element of the project's mode of interpretation. In addition to the guiding principle defined during the second phase of the PM&E project, the NP project developed and negotiated its own guiding premises. The following general premises were defined as the most important to the project's mode of interpretation:

- *Existence is an eternal search for coherence and correspondence to obtain sustainability;*
- *The world is a web of relations between all the forms of life;*
- *Reality is that, which our worldview allows us to perceive;*
- *History is a permanent construction, fragmentation and reconstruction of coherence and correspondences that continuously generate rules of the game;*
- *Actions of individuals are conditioned by rules of the game and their worldview;*
- *Institutional innovation is an interactive process to reconstruct coherence and correspondence;*
- *Humanity experiences a change of epoch from the second half of the twentieth century.*
- *A change of epoch fragments coherence and correspondence, creating a perception and legitimacy crisis, generating institutional vulnerability* (Red Nuevo Paradigma, 2003).

Other elements of the project's mode of interpretation include the definitions of key concepts, such as: *social network, coherence, correspondence, historical epoch, development*, etc., and the selection of existing theories (critical theory, systems theory, actor network theory, etc.) and approaches (constructivism, dialectic, strategic, etc.) that could be useful for research and other interpretative efforts[50].

A purpose can be achieved in different ways, but not just any way. This is why the project defined its theory of action to inform its effort with regard to the NP project's purpose (see Figure 7.6). The elements of the NP project's theory of action are grounded in its core philosophical adherence to specific axiological, ontological and epistemological perspectives. As such, the theory of action is expressed through the ethical principle of intervention and the methodological premises for the generation of knowledge and capacity development.

For the NP project, collaboration with its stakeholders takes place under the philosophical premise of practices the development **of** and not development **in** the organisations (see Figure 7.6). According with this principle "*the development **of** organisations is necessarily negotiated and made with the participation of the social actors of the context in which the intervention actions are developed*" (*ibid*.).

[50] On more of this visit *http://www.paradigma.or.cr*

According to the methodological premise behind the NP action-research and systematisation activities, "*knowledge is socially relevant when it is generated in the context of its application and implications*". From this premise, practical implications were derived to orient associated professionals in their *praxis*. For example, "*the construction of knowledge about institutional innovation has to start from the local capacity, experience, knowledge and realities*" (*ibid.*).

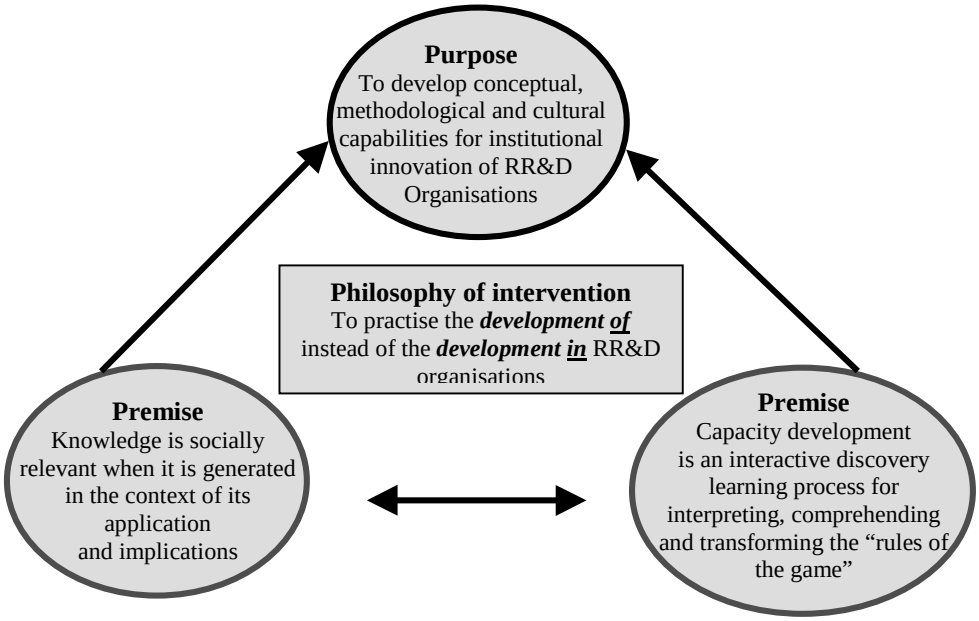

Figure 7.6 NP project's theory of action

Regarding capacity development, the methodological premise of the NP theory of action is that: "*capacity development is an interactive discovery/learning process for interpreting, comprehending and transforming the "rules of the game*". Therefore, as a practical consequence, this will require the adoption of a multidimensional inclusive perspective for capacity building that necessarily develops not only instrumental skills, but also the intellectual abilities and the definition of values and principles according to local historical and cultural realities and aspirations (*ibid.*).

As a matter of fact, the fourth external program and management review (4th EPMR) of ISNAR carried out in 2002 by a panel of experts designed by the CGIAR centres, concluded that only a few ISNAR's project are effectively contributing to the attainment of ISNAR mission. Among these few projects the NP project stands out. For instance, the panel of experts recognised that: "*in situations, such as Mexico and Cuba, where national stakeholders are the owners and drivers of their change process, ISNAR has facilitated major inputs into the overall institutional change process. These cases also demonstrate the interactive feedback in the research-service continuum. For example, the work in Cuba was initiated as a service to support the institutional change process, which had already been initiated. Through active participation of the Cubans who developed their own approach to participatory self-assessment, the overall project has greatly benefited in its conceptual development, and has generated new research products. Networks such as the New Paradigm Project facilitate transfer and exchange of these lessons among participating organisations. Some universities have restructured courses following the Project's frameworks*" (CGIAR, 2002:33)

Moreover, the way the NP project explicitly defined its theory of action influenced other ISNAR components that decided to go the same way. This is the case of the so-called MTP2 - Linking Research and Stakeholders Mid-Term project. Supported by one of the NP project's 'intellectual focal point' this program embarked upon making a collective definition of its theory of action.

The panel of experts in the 4th EPMR commended the leader of the MTP2 and his group for initiating a strategic discussion of its theory of action. As the panel pointed out: "*through its 'theory of action', case studies and participatory networks, services are being provided at the same time that both national partners and ISNAR develop, adapt, and test new knowledge and methods. The New Paradigm Project is an example of where a blend of participatory action in a number of organisations/countries, provides opportunities to develop new ISNAR products, usually in the form of decision tools and participatory methods*" (*ibid.*:53)

In the next section, the factors and lesson learned by the participants in constructing the NP theory of action are presented.

7.4.4 Factors and lessons learned by participants

This section is based on interviews with project facilitators and the results of the group discussion during the reflective feedback workshop held in San José, Costa Rica in December 2002.

Facilitating factors of innovation

Associated professionals and regional facilitators identified the following external factors facilitating innovation:

- the increasing importance of institutional innovation and the generalised dissatisfaction with the prevailing mode of collaboration in RR&D efforts;
- raised awareness in creating conceptual and methodological autonomy of local talents and in accepting their contributions to RR&D interventions;
- the relevance of a project's products and services with regard to the interests and necessities of the regional context; and
- the political will of the regional RR&D organisations and professional talents to support, transform and take ownership of the project.

In addition the following internal factors facilitating innovation stand out:

- the coherence of the project's theory of action and the ethical consistency of its intervention mode, based on the solidarity and co-responsibility with the local actors;
- the diversity of experiences, professional backgrounds, cultures, ideologies and worldviews of the participants in the NP project and their creativity and commitment to develop and to implement the project's proposals in an innovative way;
- the reflective character of the project, favoured by means of the creation of spaces and conditions for interaction among regional talents;
- the development of shared strategies for intervention and their later implementation, through negotiated participatory processes;
- the leadership, constancy, consistency, resistance, patience, anger and passion of a project's management team and its disposition to defy the "*authorities*" and dominant paradigms, including a break with the rules of the game, maintaining the coherence and correspondence of the project's theory of action;

- the project leader's level of innovativeness, his incentive of curiosity and managerial flexibility towards individual and collective creativity. As one of interviewee said: "*It is to the personal merit of Jose de Souza that the project was well maintained. His forms of discipline were found to be agreeable but also very effective"* (Interviewee 30, this research); and
- The permeability to creatively incorporate the interests and necessities of the context into the project's proposals (contextual awareness) and to interactively gain access to fresh theoretical and methodological perspectives through the designed interaction with international intellectual focal points.

Restricting factors of innovation

The following external factors restricting innovation were identified by associated professionals and regional facilitators:

- the extent of financial uncertainty with which the project handles itself. When this uncertainty is high, it can make the project dependent on the donors' theoretical and methodological perspectives, as some use financial resources as a factor of pressure, control and manipulation;
- The mainstream theory of action for institutional innovation and the resistance to change within R&D organisations, associated with the maintenance of the status quo and personal privileges, imposes limits on the activities of the project and has in some cases jeopardised the accomplishment of the project's mandate; and
- The asymmetrical relations of power in the field within the international collaboration do not currently favour the creation and strengthening of the conceptual and methodological autonomy of local talents in rural R&D efforts.

Regarding the internal factors restricting innovation, the following points stand out:

- not all those trained by the project's professionals changed their attitudes and ways of thinking about institutional innovation;
- Not all those trained by the project's professionals who do change their attitudes and ways of thinking about institutional innovation, remain linked to the project;
- financial limitations and time constraints reduce the possibilities of being more effective in achieving the project's purpose and in attending to other RR&D organisations that demand project support;
- lack of diffusion (dissemination) of project's activities and materials results in a lack of visibility of the project contribution; and
- lack of communication and sharing of information among the project's associated professionals limits the scope of project influence.

Lessons learned

Associated professionals and the regional team of facilitators drew the following major lessons from the experience of institutional innovation within the NP project.

- **There is no institutional change without learning**: Institutional change processes must include research and systematisation activities that allow for learning from experiences.
- **Conceptual and methodological guides and insights are needed:** Conceptual and methodological guides and insights need to be available in varied forms - metaphors, premises, principles, hypotheses, orientation frameworks, etc. - in order to orient the processes of interaction both within and outside of the project.

- **Intermediate results are needed**: The change process must offer intermediate innovative results, in order to maintain the interest of actors involved;
- **A praxeology for institutional innovation is needed**: It is important to recognise the mainstream theory of action, as well as other theories of institutional innovation that are informing changes in RR&D organisations.
- **Negotiation skills need to be developed**: It is important for change facilitators to develop appropriate skills to negotiate with external actors.
- **An inward-reaching strategy is necessary**: The change initiative has to develop and implement a strategy to gain political support within its own organisation.
- **An outward-reaching strategy is necessary**: The change initiative needs a strategy for increasing its visibility within social movements (global, regional and local), which are struggling for change in the current "rules of the game".

The next section present a synthesis of the comparison of the PM&E and NP projects' theories of action.

7.5 Comparative analysis of theories of action for capacity-building of RR&D organisations

In Table 7.3 the dimension of theories of action shaping the process of innovation in capacity-building projects are summarised and compared.

Table 7.3 Dimension of theories of action shaping innovation process in capacity-building projects

	PM&E project	**NP project**
Rationality	Strategic (Instrumental)*	Communicative
Scientific paradigm	Eco-centric	Holo-centric
Social worldview and image of organisation	Economic Project as interacting production system, provider of products and services	Holistic Project as facilitator of change and development
Cultural worldview	Hierarchy (Egalitarianism)*	Egalitarianism
Conducive policy framework	Diffusion of innovation, modernisation of state, agricultural treadmill	Fragmentation of the rules of development, anthropogenic eco-challenge
Driving forces of institutional change	Competitiveness, effectiveness and management efficiency	Solidarity, social commitment and organisational sustainability
Perception of the context	Epoch of change, capitalistic globalisation	Multidimensional, multiple actors, perspectives and interests. Change of epoch

* There are some elements of 'dominated' worldviews that co-existed with the leading one. The former is shown between brackets.

According to the experience s of the PM&E and NP projects, it has proven possible to generate a significant shift of value frameworks (rationality, scientific paradigm and worldviews) as well as in the perception of the context.

- During the second phase of the PM&E project, the instrumental rationality, techno-centric paradigm and mechanistic worldview that predominated in the first phase were transcended. As shown in Table 7.3, at the end of the PM&E project, the project actors constructed a new internal consistency of the project theory of action in which a strategic rationality, an eco-centric scientific paradigm and an economic worldview had taken over.

- A shift was less noticeable in the PM&E project's cultural worldview, but during the first phase, it was clear that a hierarchical worldview predominated, due to the professional background of the majority of the participants working in the public bureaucratic S&T organisations. The predominance of a hierarchical worldview during the second phase was evident from the key leading role that strategic planning conferred to the *technical and political leadership* of the change process, as well as to the *strategic intention* of top managers of the S&T organisations. Nevertheless, the participatory character of the change processes in the pilot cases, and the key role of local talents in the development of the project's training materials (see section 5.4.3), introduced some elements of an egalitarian cultural worldview that co-existed with the predominant one.

- The development of an innovative dynamic in the NP project occurred because of the explicit construction of its theory of action. The collective construction and appropriation of knowledge for institutional innovation allowed the major shift to a communicative rationality, a holo-centric paradigm, a holistic social worldview and a truly egalitarian cultural worldview.

The shift in worldviews, paradigms and rationales is strongly linked to the development of a new qualitative perception of the context.

- While the actors in the PM&E project perceived the changing nature of the context, during the implementation of the NP project, these actors realised (learned!) that the simultaneous changes in human experience, culture and socio-economic relationships are signals of the changes taking place in the transition towards a new historical epoch.

- This radical shift in the perception of the context and the search for coherence and correspondence allowed for innovative changes to emerge from face-to- face interactions among associated professionals, facilitators of local institutional change and the NP project's international intellectual focal points.

These dimensions in Table 7.3 are internally consistent with the organisational practices summarised in Table 7.4.

- The major internal tensions within the PM&E project's elements of organisational *praxis* continued to be expressed through its facilitation and participatory practices. On one side, the traditional top-down approach to *deliver training* and to *facilitate* institutional change processes was challenged by the opportunity given for internal, critical, interactive participation in the production of training materials. On the other side, external participation was encouraged, but without questioning the pertinence and relevance of the generated conceptual and methodological tools and insights. A lack of coherence and correspondence was evident.

- The search for coherence and correspondence in the theory of action for institutional innovation in RR&D organisations have lead the NP project to extend internal critical, interactive participation to the external domain and to stress the negotiating character of project interventions.

Table 7.4 Organisational *praxis* for institutional innovation in ISNAR's capacity-building projects

Organisational practices	PM&E project	NP project
Type of change practised	Transformational, proactive changes focused on S&T organisation's demands and management of change	Transformational proactive changes focused on stakeholders' autonomy and management of innovation
Way of learning about institutional change	Learning by doing, mainly "*single- loop learning*"	Collective learning, "*double- and triple- loop learning*"
Facilitation of institutional change	Top-down directive, advisory work, delivery of "recipes" by external PM&E experts, training of local trainers	Negotiated intervention, promotion of autonomy of local talents
Configuration for change	Informal network, bureaucratic hierarchies	Learning communities, communities of practice linked in network-like configurations
Management model of institutional change	Strategic management model, demand-oriented	Context-centred organisational management model based on the authority of arguments
Participation of internal and external actors	Critical interactive internal participation; liberal and functional external participation	Critical interactive internal and external participation
Development of strategies for institutional change	Rational instrumental perspectives, planning school	Context-centred cognitive-subjective perspectives
Time orientation of changes	Long-term orientation	Long-term orientation

7.6 Conclusions (David against Goliath: will it be a happy ending?)

The process of constructing the NP theory of action for institutional innovation in RR&D organisations was analysed in this chapter, and provides some insights that can be considered in answering the research questions advanced in the research design section.

Research question 1: How do change agents develop and deploy an alternative theory of action in such a way that they can overcome the limits imposed by the mainstream theory of action?

It is clear to me that it is not coincidental that the following processes were crucial for the construction of the NP theory of action:

- a change in the perception of the context due to a shift to "out of the box" thinking, within participatory action-reflection processes;
- the incorporation of fresh theoretical and methodological perspectives and approaches through critical debate and discussions about their pertinence and relevance;

- the creation of spaces for interaction, bringing together people with different worldviews, experiences, professional backgrounds and interests, with the explicit purpose to reflect about the NP mode of interpretation and theory of action; and
- the convergence of professionals who agreed on interacting on the basis of solidarity, ethical relationships, and social commitment.

The multidimensional interaction of these processes allowed for individual and collective learning *by doing*, but more important *by being* creative, courageous and innovative.

Research question 2: How does institutional innovation in the NP project reflect the contradictions of the change of epoch and the development of a new paradigm of international co-operation for capacity-building in RR&D interventions?

The process of construction of the NP theory of action was not a linear movement in a continuum track, from blueprint to interactive, negotiated interventions. On the contrary; conflicting worldviews, paradigms and rationales influenced diverse actors in the unequal struggle between the new emerging paradigm and the mainstream theory of action for co-operation in capacity-building intervention. From the analysed reconstruction of the NP project's institutional innovation, it seems to me that when a new theory of action or a new paradigm is emerging, agents of the mainstream will try to:

- first, ignore it as if it does not exist; then, if it continues to blooms, they will:
- second, eliminate it; for example, removing political and financial support; if this strategy does not works, they will:
- third, coopt its representatives and use its conceptual categories in an attempt to adapt them to the mainstream.

How will this process end?

I will return to this question and to other issues raised in this chapter in the following chapter, in which the three cases will be synthesised and the research findings elaborated towards a new understanding of institutional innovation.

Chapter 8. Towards a New Understanding of Institutional Innovation in RR&D Organisations

8.1 Overview

As has been argued in the previous chapters, we are living in a transitional period brought on by a change of epoch. The trademarks of the transition to a new historical epoch are turbulence, uncertainty, disorientation, instability, insecurity, and discontinuity. Vulnerability is its widely observed consequence. This complex reality of the transition period suggests that the world is liberalising and changing for the better, but at the same time it is integrating and disintegrating, concentrating and excluding, and deepening the poverty and inequality. Therefore, all nations and organisations are at present under some degree of vulnerability; what varies is their capacity to interpret the genesis of this vulnerability and to project its implications onto its future activities. RR&D organisations in particular need to interpret the fragmentation of the dominant rules of development and to understand how these rules are shaping the actions that have led to the current institutional crisis. This interpretative effort will require creativity and the development of collective learning skills.

Creativity is the product of team efforts and, therefore, a product of social interaction, organisation and participation (Gibbons *et al*., 1994; Röling, 1992). However, in order to mobilise the intelligence and creativity of an organisation's human talent through effective teamwork, managers and facilitators of institutional innovation processes need theoretical and methodological recommendations to be able to produce understanding within the newly created space for interaction.

This chapter tries to present the research findings reported in the previous chapters by using an explanatory model of institutional innovation. This model will hopefully help to provide an analytical synthesis of the praxeology of institutional innovation in the three case studies, and to reveal implications for the *praxis* of institutional innovation of RR&D organisations and for international capacity-building. In other words, I will start by conceptualising institutional innovation, for which I will present a model of institutional innovation in RR&D organisations. Using that model as an analytical framework, the results of the three case studies will be analysed and interpreted. This allows me to answer the research questions that this dissertation addresses. Finally, I will present the implications of my research findings for RR&D organisations' innovative *praxis* and for capacity-building interventions.

8.2 Institutional innovation in a change of epoch

All innovations are changes; but all changes are not innovations. Innovation is understood here as the "*emergent property*" of the interaction among social actors, to interpret, decide and act to produce qualitative transformation in their organisational *praxis* so as to maintain correspondence with the perceived necessities and demands of their relevant context.

Thus, what is innovation in one **context** is not necessarily so in another. For example, the introduction of greenhouses into horticulture is the most recent technical innovation in Panamanian agriculture, whereas in The Netherlands they were widely introduced in the fifties.

Moreover, what is perceived as 'new' or 'novel' in knowledge generation and application is a matter of **coherence** among theories, paradigms, rationality and worldviews. The use of pesticides was considered an appropriate strategy of modern farming within the framework of the "*green revolution*". In contrast, today, biological control is considered to be an innovation within the framework of organic agriculture, which leads to a reduction in the use of pesticides. This means that a different coherence leads to different problem definitions, different sets of relevant questions and therefore to different solutions.

Therefore, I will consider institutional innovation as a context-specific interactive learning process towards transformational changes of a set of "rules of the game" with implications for the identity of RR&D organisations. In this sense, based on the critical questioning of an organisation's identity through institutional innovation, an organisation's actors develop new modes of interpretation, value frameworks and theories of action that aim to confer a greater degree of ***correspondence*** with its external operational context. The interrelationships of these dimensions of institutional innovation are shown below in Figure 8.1.

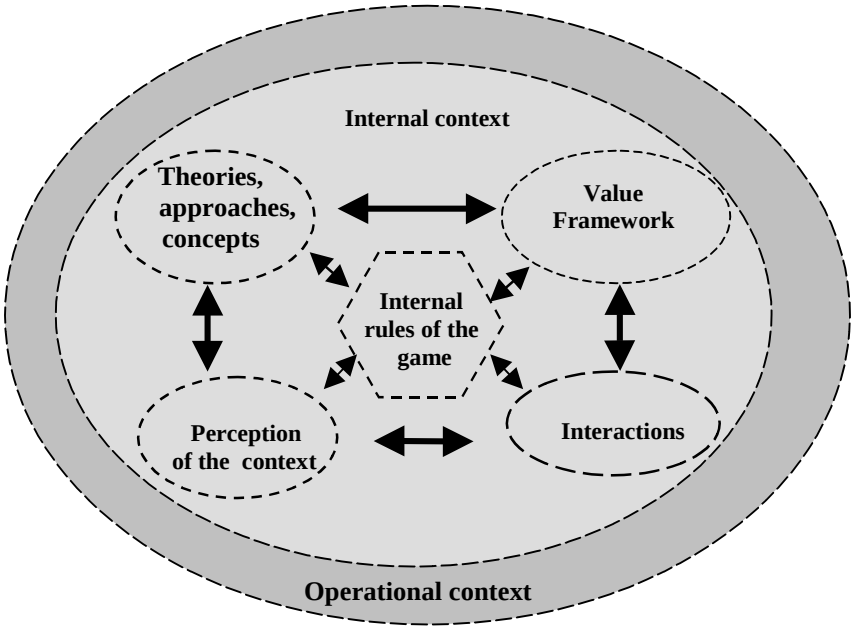

Figure 8.1 Model of institutional innovation in RR&D organisations (after Bawden, 2000; and Röling, 2002).

The model of institutional innovation represented in Figure 8.1 is based on what biologists, philosophers, system thinkers and social scientists call 'cognition', the essence of knowledge-based action of sentient beings. The essential elements of cognition that are widely recognised are: context, emotion and values, perception,, theory and action (Bawden, 2000 and 2001; Maturana & Varela, 1992; Miller, 1985; and Röling, 2002). In Figure 8.1, the organisation is taken to be a 'sentient being'. Its members interact to generate organisational knowledge-based action. They play complementary or 'distributed' roles. In order to so, they share worldviews, values, emotions, theories of action, and perception of the shared context.

I other words, figure 8.1 presents *five elements*, and their interrelationships, which are considered to be crucial for understanding institutional innovation, both at the individual and collective levels, within their domain of existence the internal and operational contexts:

1. **Mode of interpretation:** Including the most important theories, approaches and concepts for understanding, commonly referred as the organisational conceptual framework.
2. **Perception of the context:** How the operational context is perceived and consequently how it affects and is affected by organisation's *praxis.*
3. **Value framework:** Organisational **v**alues, paradigms, worldviews and rationality determine to a great extent the way processes of change are conceived and carried out.
4. **Interactions** among organisational actors in their search for coherence among the *five elements* and for correspondence with the external operational context.
5. Internal **rules of the game:** norms of behaviour and reward systems that regulate people's relationships within the organisation.

The tendency of these *five elements* towards internal consistency within the organisational *praxis* is what I call here the *requisite for coherence*. In addition, the *requisite for correspondence* expresses the tendency of these elements to seek external consistency between the aspirations and needs of actors, on the one hand, and the rules of development within the operational context, on the other.

The following premises and assumptions underpin this model:

- The existence of individuals and organisations is a permanent process of construction and reconstruction of *coherence* and *correspondence.*
- The way we see the world determines the way we act in it.
- The perception and interpretation of the changing context is crucial for understanding the genesis of organisational vulnerability and to transform the rules of the game to meet the *coherence* and *correspondence* requisites.
- Institutional innovation emerges from social interaction and is context- specific.

This model has the dialectic dynamic of a contradiction and convergence between *coherence* and *correspondence*. On one hand, when the operational contexts changes, demanding a new correspondence, this will in turn lead to the need for a new coherence. On the other hand, the reconstruction of internal consistency among the *five elements* of institutional innovation leads to the need to establish new correspondence with the operational context. Therefore, developing a better understanding of institutional innovation processes requires us to first and foremost recognise that there is no "*single best way*" to set about it. This means adopting a flexible, contextual stance, which embraces diversity and complexity, instead of assuming that institutional innovation is simply matter of transferring technical know-how.

Moreover, institutional innovation should lead to changing the organisation's theory of action, which has here been defined as: ***a set of principles of behaviour, shaped by paradigms, worldviews, and by theoretical and methodological premises to inform the way a given organisational purpose can be achieved in an effective way***. But the theory of action that underpins change processes influences the understanding of what is institutional innovation, the purpose to be achieved with the process and the social organisation of the initiative. Hence, I will continue this discussion by applying the model of institutional innovation as a framework to analyse and interpret the results of the three case studies while answering the research questions.

8.3 Research question one:

What are the main theories of action that inform the processes of institutional change and innovation in RR&D organisations?

It is impossible to get out of complex problems under the same rules, and with the same theories of action that have created them!

The analysis of three case studies' experiences of institutional innovation in this research aimed to identify the theories of action informing them. In Table 8.1, the predominant dimensions of the theories of action in the three case studies are summarised. In spite of the differences and similarities between these dimensions within the cases studied, as discussed in the previous chapter, it is possible to see some patterns when the predominant value frameworks of each case are analysed and compared.

As was stated above, there are two tendencies to be examined regarding the *coherence requisite*: internal consistency among the different dimensions of theories of action, and internal consistency between them and organisational *praxis*. In terms of internal consistency among the dimensions of the theories of action summarised in Table 8.1, it is possible to cluster them into four perspectives:

1. **Mechanistic-instrumental**: that informed the supply-driven and science-driven change processes in IDIAP.
2. **Economic-strategic**: that informed demand-driven institutional change process in IDIAP, and the processes of change in APASAN's and within the ISNAR's PM&E project.
3. **Evolutionary-strategic**: that informed FUNDICCEP's change process.
4. **Contextual-communicative**: that informed the NP project's innovation process.

In terms of internal consistency between these perspectives and elements of organisational *praxis* as summarised in Table 8.2, there are some remarkable differences between cases grouped within the same perspective. While the *economic-strategic* perspective in APASAN's change process was applied extensively and deeply (consistently), to the demand-driven IDIAP and in the PM&E project, it was applied less radically. Thus, the public bureaucratic nature of the latter two cases, and the internal dynamic favoured by the encouragement of participatory processes made the difference, when compared with APASAN's case. As was stated in chapter 6, the individualistic cultural worldview within APASAN's institutional change process was favoured by the great influence of USAID's ISP, that created a "*competitive environment"* as a means for strengthening an "*elite set of NGOs."*

The *mechanistic* social worldview prevailing in supply-driven and science-driven IDIAP is also expressed differently in each case. Indeed, in science-driven IDIAP, as the rationality continues to be instrumental the "*machine*" is only more complex and is constituted by information networks. Therefore, the organisation is considered functioning as an 'information system' that consumes, transforms and generates information in the form of "*ordered bodies of scientific knowledge*" and scientific services. This updated *cybernetic* social worldview emphasised the leading role of techno-science in the rising effectiveness and efficiency in production and management processes.

Table 8.1 Dimensions of theory of action for institutional innovation in the three case studies

	Supply-driven IDIAP	**Demand-driven IDIAP**	**Science-driven IDIAP**	**FUNDICCEP**	**APASAN**	**PM&E project**	**NP project**
Rationality	Instrumental	Strategic	Instrumental	Communicative	Strategic	Strategic	Communicative
Scientific paradigm	Techno-centric	Eco-centric, hard systems thinking	Eco-centric, hard systems thinking	Ego-centric	Eco-centric	Eco-centric	Holo-centric
Social worldview and image of organisation	Mechanistic Provider of technical solutions	Economic Production system (change agent)	Mechanistic Laboratory, provider of scientific information and technology	Evolutionary Organisation as living organism	Economic Organisation as provider of products and services	Economic Project as interacting production system (provider of products and services)	Holistic Project as facilitator of change and development
Cultural worldview	Hierarchy	Hierarchy	Hierarchy	Egalitarianism	Individualism	Hierarchy	Egalitarianism
Conducive policy framework	Import substitution, structural adjustment policies	Reform of state, capitalistic globalisation, agricultural treadmill	Reform of state, capitalistic globalisation, agricultural treadmill	Environmental and agricultural sustainability	Privatisation of public services, community self-management, conservation of NR	Diffusion of innovation, modernisation of state (agricultural treadmill)	Fragmentation of the rules of development, anthropogenic eco-challenge
Driving forces of institutional innovation	Agro-technical change, international co-operation	Market, competitiveness, organisational sustainability	Science, efficiency of research, scientific productivity	NATURA's ISP, organisational adaptability	USAID's ISP, demands, market, competition	Competitiveness, effectiveness and management efficiency	Solidarity, social commitment and organisational sustainability
Perception of the context	Stable, more or less controllable	Uncertain, but offers opportunities (long-term planning based on scenario building reduces uncertainty)	Complex but manageable, applying scientific knowledge	Complex, uncertain, it is possible to create harmony or equilibrium	Complex but manageable and programmable	Epoch of change, capitalistic globalisation	Multidimensional, multiple actors, perspectives and interests. Change of epoch

Source: This research.

In addition, the two well-established mainstream perspectives called *mechanistic-instrumental* and *economic-strategic* here show a high level of consistency, concerning organisational *praxis*. Although the RR&D organisations studied seem to be unaware in that their mode of intervention is influenced by these value frameworks, their organisational praxis is very consistent. Under these perspectives, institutional innovation is a deliberate, explicit, simple and controlled process of searching for new opportunities for conceiving new strategies, and for implementing changes in the organisation's products and services. The coherence between these two perspectives also explains their main limitations related to the fact that they:

- restrict their analyses and actions to the world of facts, ignoring the intangible world of values, ideas, ideals, interactions, connections, relations, commitments and aspirations of internal and external actors;
- promote learning by imitation, where "benchmarking" serves as a vehicle for transferring formulas and rigid prescriptions for contexts that were not considered during their formulation;
- reduce their complexity to their technical and economic dimensions and to the problems of lack of information, ignoring other dimensions and factors;
- propose that all solutions are obtained by means of analytical techniques, that only provide information on certain specific parts of a complex problem, without generating an understanding of the whole;
- promote a new wave of social Darwinism, spreading the concept of competitiveness being synonymous to competition; and
- rely on hard sciences and on market forces to cope with new challenges faced by RR&D organisations.

Regarding the *evolutionary-strategic* perspective, the evidence gathered in this research and discussed in chapter 6 shows some inconsistencies within the *praxis* of the studied ENGO. In my opinion, such inconsistencies reflect to some extent the internal tension of this 'hybrid' resulting from the mix of not always convergent perspectives, such as an evolutionary and economic social worldview, and an instrumental and communicative rationality. On one hand, if the context is perceived as uncertain and dominant in the interface between human action and environment, and the organisation is perceived as a living organism, then the adaptation to the environment will be the most likely way to survive. On the other hand, using ACCESO's framework for strategic planning allowed for the development of a set of organisational strategies, which consider the situation of external factors and the stance of relevant actors concerning environmental development. In this way, the ENGO will play an active role in constructing its own future.

In contrast with the rational-economic approach to developing organisational strategies, the studied ENGO is trying to construct alliances based on the co-operation with its partners towards environmental sustainability. This approach to development of strategy places less attention on the conflicting interests and tries to surpass existing asymmetrical relationships of power. On the other hand, hybridisation may help overcome the greater limitation of an evolutionary worldview to organisational change, which is that it leaves little or no room for initiative and creativity since the environment will in the end always determine the organisation's survival.

Table 8.2 Organisational *praxis* for institutional innovation in the three case studies

Organisational practices	Supply-driven IDIAP	Demand-driven IDIAP	Science-driven IDIAP	FUNDICCEP	APASAN	PM&E project	NP project
Type of changes	Incremental, reaction to changes in governmental policies	Transformational, proactive change. Focus on technological demands, partners and beneficiaries	Incremental, "*to adjust the organisation to international scientific standards*"	Incremental, adaptive, reactive changes, focused on establishing alliances	Transformational, reactive changes focused on client, partner and competitors	Transformational, proactive changes focused on S&T organisation's demands and management of change	Transformational proactive changes focused on stakeholders' autonomy and management of innovation
Way of learning	Trial and error, experimentation, single-loop learning	Collective "*learning by doing*", mainly *single-loop learning*	Learning through application of scientific methods of research, *single-loop learning*	Interactive collective "*learning by doing*", single-loop learning	Imitation of benchmarks, adoption of external recipes, *single-loop learning*	Delivery of training "*learning by doing*", mainly "double- *loop learning*"	Collective learning, "*double- and triple-loop learning*"
Facilitation	Top-down directives, advice by external consultants	Charismatic technical and political leadership	Top-down directives, advice by senior scientists	External facilitator, acting as catalyst of internal initiatives	External advisor, top-down directives, central role of top leader and advisors	Top-down directive. Advisory work, delivery of "recipes" by external PM&E experts. Training of local trainers	Negotiated intervention, promotion of autonomy of local talents
Configuration of change	Hierarchical, formal structure	Hierarchical, informal structure	Hierarchical, formal structure	Network-like, learning community	Hierarchical, bureaucratic structure	Informal network, bureaucratic hierarchies	Learning communities, communities of practice linked in network-like configurations.
Management model of innovation	Personal management model based on the argument of authority	Strategic management of institutional change based on the authority of argument	Personal management model based on the argument of authority	Externally constrained management model based on decision-making by consensus	Personal management model	Strategic management model, demand-oriented	Context-centred organisational management model based on the authority of arguments
Participation of internal and external actors	Non-participation	Active, negotiated participation of internal actors; external participation by consultation	Internal participation by consultation; no external participation	Internal commitment to participation; no external participation	Internal participation by convenience; no external participation	Critical interactive internal participation; Liberal and functional external participation	Critical interactive internal and external participation
Development of strategies	Adaptive instrumental intuitive strategies	Strategic planning approach	Rational, instrumental development of strategies, planning by objectives	Multidimensional perspective, interactive, the environment is the key factor	Instrumental, rational planning, positioning school	Rational instrumental perspectives, planning school	Context-centred cognitive-subjective perspectives
Time orientation	Short-term	Long-term commitment	Medium-term	Long-term orientation	Medium-term orientation	Long-term orientation	Long-term orientation

Finally, the *contextual-communicative* perspective is very consistent in its organisational *praxis*. Although it is just emerging, two factors can explain its high degree of internal consistency. First, it was a result of a deliberate effort of collective construction and appropriation of knowledge. Second, it is still restricted to a reduced community of practice - the New Paradigm network.

The four perspectives obtained from the empirical study are presented in Table 8.3, as four ***theories of action*** for institutional innovation, in which the *five elements* of the model presented in Figure 8.1 serve as the organising framework.

Table 8.3 Theories of action for institutional innovation of RR&D organisations

***Five elements* of institutional innovation**	**Theories of Action**			
	Mechanistic-instrumental	**Economic-strategic**	**Evolutionary-strategic**	**Contextual-communicative**
Mode of interpretation	Systems theory (hard systems thinking), scientific management and re-engineering	Institutional economy, strategic planning, systems theory (hard systems thinking)	Human sustainable development, ecosystems management, conservationism	Actor Network Theory, soft systems thinking, constructivism, critical theory
Value framework	Instrumental rationality, techno- and eco-centric paradigms, mechanistic social worldview, hierarchical cultural worldview	Strategic rationality, eco-centric paradigm, economic social worldview, hierarchical and individualistic cultural worldview	Communicative rationality, ego- and eco-centric scientific paradigms, holistic social worldview, egalitarian cultural worldview	Communicative rationality, holo-centric scientific paradigm, holistic-contextual social worldview, egalitarian cultural worldview
Perception of the operational context	Context is manageable, controllable, and predictable. Science & technology are seen as playing key role in coping with the context	Context is an *arena* for competition with opportunities and threats. Strategic planning (scenario building) is given key role in coping with the context	Context is uncertain and dominant. Nature is fragile and harmonious. Adaptation as means to create and maintain the input-output equilibrium of organisations.	Context is complex, and contradictory. Change of epoch fragments the coherence and correspondence of the rules of development
Basis for interaction	Technology development, agro-technical change	Competition, bargaining, strategizing	Interactive co-operation, reaching agreement	Interactive negotiation, networking
Internal leading rules of the game	Scientific meritocracy, control of nature for human purposes	Social Darwinism, market forces optimise the utility and define the survival of most competitive	Trust, responsive relationship with nature, equity and mutual respect among people	Social commitment, solidarity, ethical relationship with nature and other people

8.4 Research question two:

How does institutional change in RR&D organisations reflect the contradictions of the change of epoch and the development of a new paradigm of international co-operation for capacity building in RR&D interventions?

Whales become beached, not because they are giants, but because they have lost their sense of direction!

The cases studied in this research reveal the great organisational vulnerability that characterises RR&D organisations. The consequences of organisational vulnerability are: the drastic loss of credibility, legitimacy, recognition, and therefore political and financial external support. In order to reverse their vulnerability, these organisations are struggling to build a new basis for their sustainability. Nevertheless, most of them have not overcome their crisis of perception and interpretation as a result of "*blinding insights*" created by theories of action that informed their praxis for institutional innovation and the ongoing fragmentation of the rules of development within their operational context.

The crisis of perception and interpretation they are experiencing, and the lack of correspondence with the changes in the context, impede these organisations from understanding what is going on and consequently they are incapable of projecting the implications of this situation in their organisational sustainability. These organisations are entangled in a "vicious circle" of: crisis of perception, loss of relevance, crisis of legitimacy and lack of correspondence.

Within this vicious circle of organisational vulnerability, some of the organisations studied continue to rely on the same theory of action for institutional innovation that brought them into an institutional crisis. This is the case for changes in "science-driven IDIAP". The mechanistic-instrumental theory of action grounded in the mainstream realist, positivistic sciences that informed these changes not only did not help in building organisational sustainability, but it also produced a "reverse effect". In my opinion, as was stated in chapter 5, the changes in IDIAP, especially over the last three years, contributed to greater rather than less vulnerability. Moreover, the creation of FIAFOR is increasing IDIAP's vulnerability.

In addition, the observed inconsistencies and tensions among the theories of action for institutional change reflect the crisis of perception and interpretation and the low *degree of institutionalisation* of these organisations. These are more evident in the studied ENGOs that showed low degree of conceptual and methodological autonomy while working with powerful actors such as USAID, the World Bank and international NGOs.

In addition, as stated in chapter 7, the process of construction of the NP theory of action was not a linear movement along a continuum track, from blueprint to interactive, negotiated interventions. On the contrary - conflicting worldviews, paradigms and rationalities influenced diverse actors in the unequal struggle between the new emerging paradigm and the mainstream theory of action for co-operation in capacity-building interventions.

When the fragmentation of the rules of development is perceived to be affecting the organisation's performance, and the RR&D organisation decides to embark upon a change process that involves developing a new identity, mode of interpretation, and theory of action, then transformational or discontinuous changes are needed. Economic-strategic and contextual-communicative theories of action informed transformational changes in the cases studied.

Therefore, an important conclusion from the observed conflicting and contradictory processes within RR&D organisations is that institutional innovation during a change of epoch implies changes in their identities involving ethical and political decisions.

8.5 Research question three:

How do change agents develop and deploy alternative theories of action in such a way that they can overcome the limitations imposed by the mainstream?

How we see the world determines to a great extent how we act in it!

This research has shown that it is possible to develop an alternative theory of action through a deliberate institutional innovation process. It is clear to me that it is not coincidental that the following processes were crucial for the construction of the NP theory of action:

1. A change in the perception of the context due to a shift to "out of the box" thinking, within participatory action-reflection processes. This was an intensive experience that included: literature review, prospective studies and information exchange, both within and outside LAC, leading to the conclusion that humanity is not living just in an epoch of change, but in a transitional period towards a new historical epoch;
2. The incorporation of fresh theoretical and methodological perspectives and approaches through critical debate and discussions about their pertinence and relevance; among others, soft systems thinking, action network theory, constructivist and dialectic perspectives, were incorporated as part of the NP project's mode of interpretation;
3. The creation of spaces for interaction - *Ágoras*[51], bringing together people with different worldviews, experiences, professional backgrounds and interests, with the explicit purpose to reflect about the NP mode of interpretation and theory of action; and
4. The convergence of critical contributions made by many professionals who agreed on interacting on the basis of solidarity, ethical relationships, and social commitment.

The multidimensional interaction of these processes allowed for individual and collective learning *by doing*, but more important *by being* creative, courageous and innovative.

This means that innovation emerges from interaction, but is not a spontaneous process. Rather it needs to be organised. This organisation of innovation does not necessarily imply the incorporation of the rationalisation principles of *efficiency, quantification, prediction and control* (Ritzer, 1993). Too much bureaucracy limits the creative effort essential to innovation processes and diminishes or closes the free space for imagination and experimentation. Nevertheless, the absolute absence of any type of organisational configuration to facilitate innovation processes generally results in anarchy, immobilisation and/or very little pertinent innovation. (Engel, 1997; Röling & Jiggins, 1998).

The organisational effort of institutional innovation therefore needs to:

- initiate a change process that takes precedence over any individual interests;
- offer different types of benefits to most of the involved actors;
- establish some minimum organising elements, such as the definition of guiding principles and initial macro-steps; and

[51] In ancient Greece, the *Ágora* was a public assembly place for the free exchange of opinion in which there was not a dominant voice.

- provide some inspiration and motivation for creativity, such as metaphors, theoretical hypotheses and guiding premises.

In addition, in striving for a self-reflective, creative atmosphere allowing for critical, well-informed debate and the collective construction and appropriation of knowledge, institutional innovation processes should go through:

1. **Past-present (de)construction**: an analysis of premises and underlying assumptions behind the current theory of action, to know what involved actors need to *unlearn*; and
2. **Present-future (re)construction:** collective construction of new premises and assumptions that will undergird the new theory of action - what involved actors need to *learn*.

- The initiative of institutional innovation should be **linked to practice** through debating, networking and sharing with local actors in RR&D interventions**.** That is, it should be motivated neither by academicism nor by dilettantism, but by social commitment, with its implications for individual and collective praxis.

8.6 Research question four:

How are institutional innovation processes affected by (and how do they affect) the theories of action of donors and external facilitators?

RR&D organisations need neither fish nor hooks; they need to master the art of hook-making!

The institutional capacity is associated with the conceptual, methodological and cultural abilities of the community of professionals of an organisation to create, perfect, reshape and change its rules of the game. Within this perspective, development problems are not 'solvable', in the sense that one can elucidate them completely and definitively, as the rationalist - instrumental perspective suggests. They are to be interpreted and managed according to their particular historical, cultural social and material contexts. This is why one of critical dimensions of capacity-building for RR&D organisations is the collective construction of their own *conceptual, methodological and cultural frameworks*.

From the information presented in chapter 6, it is clear that change processes in ENGOs were influenced in different ways by the theories of action of donors and by the institutional strengthening programs in which they are participating.

One way of influencing ENGOs' institutional change is by referring to functions that they must perform, and approaches that they need to practise in order to receive funds or to participate in support programs.

- In the case of APASAN, the change of purpose, from "*improving human livelihoods*", to "*strengthening community self-management*" has been influenced by the theory of action of the MIDA - WORLD BANK rural poverty project.
- During the strategic planning of FUNDICCEP, the shift in the purpose from "*integrated community development*" to "*appropriated integrated development of Chiriqui Viejo river watershed*" is more in line with the objectives and funding priorities of the NATURA Foundation.

Especially in chapter 6, the analysis of change processes has shown that the donor's theory of action in facilitating organisational development and RRM plays an essential role in shaping not only what ENGOs do, but more importantly, their mode of interpretation and theory of action.

However, another way of collaborating is also possible, as in the case of demand-driven IDIAP. The dynamics of collaboration with ISNAR's PM&E project offered new insights and perspectives that contributed to increasing the conceptual and methodological autonomy of IDIAP's professionals to manage institutional change and to design and implement a new PM&E system. Furthermore, by allowing local professionals to actively participate in developing training materials and guiding frameworks for institutional change, the PM&E project was impelled to undergo a process of innovation. Furthermore, creating its own theory of action, the NP project influenced changes in the theories of action of other ISNAR's components, as was stated in chapter 7.

This leads to another important lesson emerging from the cases studied: the need to link the institutional change initiative with the organisation's stakeholders. In my opinion, this was a decisive factor in the negotiations between the NP project's management team and ISNAR's leaders and with donors as well. The fact that the project's stakeholders in LAC took over the ownership of the project and transformed it into a network for institutional innovation has contributed to the greater sustainability of the NP project. Moreover, professional talents were able not only to promote and support institutional change processes within their organisations, but to transform and make explicit the NP project's theory of action for institutional innovation in RR&D organisations.

8.7 Research question five:

What are the external and internal factors facilitating (or hampering) the institutional innovation process in RR&D organisations?

There is no institutional innovation without learning!

The actors involved in the cases studied identified and agreed on the factors affecting the processes in which they participated. I will summarise the general factors concerning institutional innovation of RR&D organisation below.

Facilitating factors of innovation
The following **external factors** facilitated innovation processes:

- external support through negotiated interventions;
- networking and sharing with other RR&D organisations;
- raised environmental awareness and the role of RR&D interventions;
- the increasing importance of institutional innovation and the generalised dissatisfaction with the prevailing mode of collaboration in RR&D efforts; and
- raised awareness in creating the conceptual and methodological autonomy of local talents and in accepting their contributions to RR&D interventions.

In addition, the following **internal factors** facilitating innovation stand out:

- the diversity of experiences, professional backgrounds, cultures, ideologies and worldviews of the participants and their creativity and commitment to developing and implementing the change process in an innovative way;

- the development of shared strategies for intervention and their later implementation, through negotiated participatory processes;
- the leadership, constancy, consistency, resistance, patience, anger and passion of managers and facilitators of innovation and their disposition to defy the "*epistemological authorities*" and dominant paradigms, including being disposed to break with the predominant rules of the game, maintaining the coherence to and correspondence with the change initiative; and
- the permeability to creatively incorporate the interests and necessities of the context into the change initiative (contextual awareness) and to interactively gain access to fresh theoretical and methodological perspectives.

Restricting factors of innovation

Participants identified the following **external factors** that restricted innovation processes:

- the extent of financial uncertainty within which the RR&D organisations handle themselves. When this uncertainty is high, it can make them dependent on the donors' theoretical and methodological perspectives, as some use financial resources as a factor of pressure, control and manipulation;
- the mainstream theory of action for institutional innovation imposes limits on the activities of the RR&D organisations and in some cases jeopardised the accomplishment of their mandate;
- the asymmetrical relations of power in the field of international collaboration that do not currently favour the creation and strengthening of the conceptual and methodological autonomy of local talents in rural R&D efforts;
- the increase of competition among RR&D organisations for resources, as a result of the increase in their number and the competitive nature of donors' policies for funding; and
- the lack of recognition of the contribution of RR&D organisations to sustainability of agriculture and rural resources management.

Regarding the **internal factor restricting** innovation, the following points stand out:

- the resistance to change within RR&D organisations, associated with the maintenance of the status quo and personal privileges;
- financial limitations;
- the fact that a number of professionals trained by RR&D organisations do not change their attitudes and ways of thinking about institutional innovation;
- the fact that a number of professionals trained who do change their attitudes and ways of thinking about institutional innovation, do not remain linked to the RR&D organisations;
- the lack of communication and sharing of information among actors in RR&D interventions;
- the lack of participation of the membership;
- the lack of participatory monitoring and evaluation of decisions and their implementation; and
- the lack of administrative and technical capabilities for the management of institutional innovation.

Before continuing with the implications of these research findings for organisational praxis, some general comments on the application of the matrices (Tables 4.2 and 4.3) and the model of institutional innovation (in Figure 8.1) are necessary:

- The matrices are helpful and appropriate for the *praxeology* of institutional innovation. Additionally they can be used as analytical tools for past-present (de)construction of underlying assumptions and premises behind the implicit or explicit theories of action for institutional innovation of RR&D organisations.
- The model of institutional innovation brings together the elements that are crucial for understanding the process of organisational change itself as well as the role of theory of action in shaping it. It can be also used for generating understanding during the collective construction and appropriation of new premises and assumptions that will undergird institutional innovation processes of RR&D organisations.
- Concerning observed inconsistencies while applying the matrices and the model, I think they are inherent to the changing nature of innovation, and explain why the search for coherence and correspondence is here considered to be the most important driver of institutional innovation of RR&D organisations.
- The application of the matrices and the model to systematise, analyse and compare different theories of action in the case studies confirmed the importance of addressing the issue of *praxeology* of institutional innovation of RR&D organisations explicitly.

In the next section, I will present the implications of my research findings for the organisational *praxis* of RR&D organisations.

8.8 Implications of the research findings for the institutional innovation of RR&D organisations

> ***"If humanity is to have a recognisable future, it cannot be by prolonging the past or the present. If we try to build the third millennium on that basis, we shall fail"*** (Hobsbawm, 1994:585)

Faced with institutional innovation initiatives, managers of RR&D organisations and facilitators of institutional change require not only conceptual and theoretical insights, but they also need methodological recommendations that they will need to socially, contextually and culturally reconfigure within the context of its application and implications. With this in mind, I will share some recommendations derived from this research that could be helpful especially for an organisational *praxis* informed by the contextual-communicative theory of action for institutional innovation in RR&D interventions.

8.8.1 Recommendations for organisational *praxis* of institutional innovation

As in other parts of this book, here I do not pretend to adopt a neutral stance with regards to the theories of action for institutional innovation. I believe that *contextual-communicative theory of action* presents a greater degree of correspondence with the emergent realities, challenges and opportunities for RR&D organisations in the third millennium. It assumes that the dynamics of the rural space emerge from relations among society, culture and nature for the development of its potentialities and the wellbeing of a majority whose existence depends on its possibilities. Contextual-communicative theory of action includes, but transcends the issues promoted as important by other theories of action to perceive and to handle the interdependencies, divergences, conflicts and contradictions that characterise rural development as a dialectic process of flow and transformation.

Therefore, in this section, people who want to promote and facilitate institutional innovation through value-laden, theory-informed engagement in interactive innovative experiences could

find some inspiration concerning the dimensions of organisational practices that have been addressed in this research (see Figure 4.4 and Table 4.3).

Facilitation of organisational learning for institutional innovation

Formal educational programs are the main sources of theories of action that explicitly or implicitly inform the practices of practitioners in RR&D efforts. Nevertheless, they do not occur without biases. Educators who train professionals have also been educated under the influence of certain theories of action adopted by their previous instructors.

Therefore, what is more important than knowing how to learn in institutional innovation, is to know how to unlearn previous premises and assumptions. In this effort, single-loop learning will not help very much.

Double and triple-loop learning is necessary in order to question the norms, principles, hypotheses, and the overall conceptual and methodological guiding frameworks of the organisation, as well as its established mindsets, through designed critical self-reflection on worldviews**,** paradigms, theories, values and perceptions of the context.

In addition, the facilitation of institutional innovation as an interactive process of exchange of experience and of negotiation for the production of knowledge by means of collective learning, requires: (i) the mobilisation of collective creativity; (ii) deliberate joint, non-coercive intervention; (iii) negotiated approaches; and (iv) decentralisation and teamwork.

Therefore, facilitators of institutional innovation must help local actors in terms of: (i) the generation of collective understanding that allows these actors to perceive their interdependence and the relevance of solidarity; (ii) organising participatory processes to create new collective learning experiences as essential ingredients for institutional innovation; (iii) creating interactive spaces for the "*exercise of participation as power*"; and (v) shaping integrative negotiation (Leeuwis, 2000; Salazar *et al.,* 2001; Groot, 2002).

The effort towards double- and triple-loop learning under a contextual theory of action would benefit from the following practices:

- The identification of existing learning communities within RR&D organisations and creation and strengthening of communities of practice for organisational learning on institutional innovation;
- the application of collective construction and the appropriation of knowledge framework (see section 7.7.4.2), starting from the systematisation of the local experiences considering the active participation of local actors;
- the linking of the organisational learning efforts with necessities, realities, priorities and aspirations of stakeholders;
- the use of interpretative questions to stimulate the development of critical and creative thought in organisational learning efforts;
- the creation of *Ágoras* for interaction, critical reflection and discovery learning;
- the stimulation of the emergence and development of local leaders for institutional innovation; and
- the participation of multiple organisational actors in the design, implementation and evaluation of learning activities.

Organising themselves, in an interactive way, for the social organisation of innovation, actors create new - qualitatively different - organisational configurations, such as platforms, coalitions,

alliances and networks, which can be seen as forms of institutional innovation. (Röling, 1993; Engel, 1997) As this research has made clear, facilitators of institutional innovation, within these new configurations, need to develop some personal skills, such as: abilities of communication, professional consistency, personal certainty, political anger, and the capacity for negotiation and facilitation of group dynamics.

Organisational configurations for institutional innovation

Different configurations for innovation can be seen as knowledge systems, in which it makes sense to talk of network-like relationships. A network-like dynamic emerges only when a growing number of social actors start to become conscious of the need to think, make decisions and act as if they were part of a network-like initiative. Therefore, networks can be seen as a set of interconnected relationships performed by social actors linked to a previously agreed-upon purpose, under a set of rules (explicit and implicit) for participation.

At different levels (see Figure 8.2) the interventions towards institutional innovation of RR&D organisations should, therefore, promote awareness about the recognition of existing and the creation of new network-like configurations.

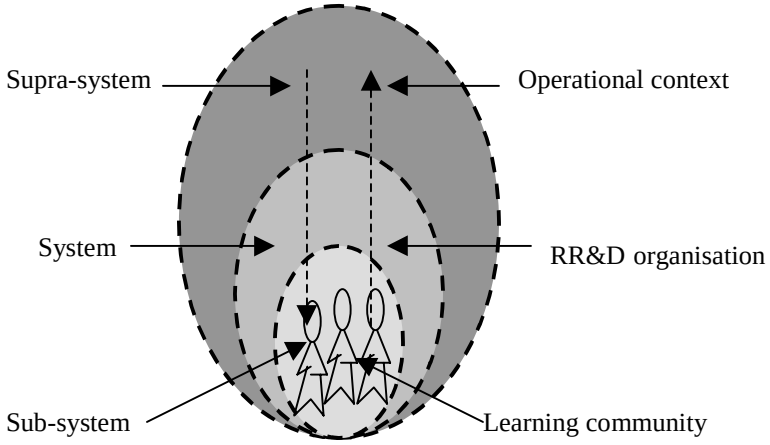

Figure 8.2 Levels of interventions for institutional innovation

This means that within organisation one can find learning communities that not necessarily have defined institutional innovation as an important issue for their interaction, because peoples hold different reasons to be (or not to be) part of a learning community. Indeed, I think the identification and strengthening of existing learning communities within organisations will be a key element for institutional innovation under contextual-communicative theory of action. This will allow the initiative to start the process of organisational transformation *changing people* instead of to start *changing hard things* (product, services, processes, etc.).

In addition, network-like configurations may link geographically disperse actors that otherwise could not interact at all. However, networking is not just about instrumentally connecting people. The theory of action, the nature of the problem to be addressed and managed by R&D organisations and their stakeholders define the characteristics of the network.

Regarding the nature of the network's purpose, *social commitment networks* are those in which concerned participants agree on the relevance of a societal problem (i.e. the institutional vulnerability of RR&D organisations) and voluntarily commit themselves to interpret and manage this problem under the guidance of a previously negotiated theory of action and under a set of negotiated participation rules.

As this research has shown, there are different types of networks among RR&D organisations. For instance, regarding the nature of the relationship between network members and donors and/or facilitators, there are some kind of *subordinated networks* or *networks under tutelage,* as in the case of ENGOs, in which the donors and facilitators have different degrees of control over purposes and rules for participation. On the other side, we can talk about *sponsored networks*, in which the donor finances them but does not interfere with their purpose and/or rules for participation, giving network members ethical and political freedom to negotiate among themselves, as in the case of the New Paradigm network.

An organisational management model is necessary

Management is the most important dimension of an organisation because it affects, positively or negatively, all the other dimensions. The dimension of management has a direct influence on organisational sustainability. In the daily activities of RR&D organisations, the tendency is to handle administration and management as two equivalent activities.

The rules for administration are defined *a priori* and are explicitly registered in the organisation's constituent documents, such as: statutes, general regulations, creation law, etc. These documents commonly define: (i) the basic functions of managers at different levels; (ii) the organisational architecture in terms of the functional and hierarchical structure that moulds the formal chains of command and authority within the organisation; and (iii) the authority of the top managers.

In contrast, the rules of management are not normally defined *a priori*. Thus it is possible for the top manager to define the rules and theory of action (s)he is going to use. That is what explains the prevalence of personal management models within RR&D organisations and the lack of an organisational one. A personal management model is totally dependent on the values, worldview, images of the organisation, knowledge, experience and interests of the managers who assume the top positions of the organisations.

Indeed, in this situation, the managerial logic, trajectory and priorities of change processes will depend on the personal management model. Moreover, when managers are not aware of the existence of different theories of action, they will follow blueprints coming from experiences based on different contexts.

Within their changing contexts, RR&D organisations are not managerially prepared to deal with changing issues for a number of good reasons. First, most of their managers are not professional managers. Traditionally, the selection process for designating a General Manager/Director in public R&D organisations has relied mainly on the scientific merit of experienced researchers in the natural sciences from within or outside these organisations. Popular wisdom says: "*we lost a good researcher and gained a bad manager*".

Second, most of the few existing professional managers have not been trained to manage transformational change in development organisations. Moreover, most loans and donations for capacity-building projects include the hiring of international consultants who commonly do not take into account local culture, history and context, assuming that they already know all there is to know for the management of institutional change and innovation.

Third, as we see from this research, many RR&D organisations are dependent on external funds and donors who are not always interested in promoting the development of conceptual and methodological autonomy in development organisations.

Finally, throughout most of the 20th century, management science has been shaped mostly by a mechanistic-instrumental theory of action, under which history, culture and context are not relevant to change the machine-organisation. On the other hand, during the last three or four decades, it has been influenced by the economic-strategic theory of action under which the organisation is perceived and managed as a provider of information and technology. None of these theories facilitates a more holistic, interactive or participatory management of institutional innovation processes in RR&D organisations.

Under the contextual organisational *praxis*, in contrast, the rules of management do not depend on the attributes and abilities of the top managers, but should be consistent with the organisational theory of action, which must influence the forms of thinking, decision-making and action of any manager within an organisation. Therefore, an organisational management model is a framework that articulates the *mode of interpretation, the perception of the context, the value framework and the rules of management* for guiding the interactions of an organisation's actors, and for orienting and influencing the forms of thinking, decision-making and action of the management team. The collective construction of an organisational management model is an important element of institutional innovation in RR&D organisations.

The practice of participation for institutional innovation

As understood here, innovation is no longer a product of the individual genius working in isolation. Innovation emerges from people's interactions, therefore the ability to learn, create and apply new knowledge as well as to transform organisational practices of thinking, decision-making and acting requires new kinds of capacities. As Leeuwis puts it "*when starting from the assumption that innovation is a collective process, other key processes come to mind … these include social learning, conflict resolution and negotiation*" (Leeuwis, 2003:9). These new capacities for participation are needed within emerging forms of co-operation, such as in various kinds of working groups and in network-like configurations both inside and outside RR&D organisations.

Until a new collective conscience is reached around the importance and necessity of the joint effort to construct a new institutional coherence, the road is long and extremely difficult, because the rationalist model of management has programmed us to act individualistically. Additionally, as has been shown in this research, economic-strategic theory of action of institutional innovation stimulates social actors to compete and it inhibits them for pursuing solidarity and participation. Participatory processes depend more on the intention of the actors involved than on the methods used for their development. Obviously, if there is a sincere intention and the participatory processes are well handled, then these will reach a high degree of aggregation of collective value. As Groot (2002) stated "*participation is increasingly recognised as the golden key to unlock the door to a more sustainable and democratic world*"(Groot, 2002:35).

In fact, there are different ways to promote participation, such as: passive participation or non-participation, participation in information-giving or pseudo-participation, participation for material incentives, liberal participation, virtual participation, functional participation, interactive or 'critical' participation and participation by self-mobilisation (Pretty, 1994; Salazar *et al*., 2001).

As was clear from the cases studied, the embraced (consciously or not) theory of action affected the way internal and external actors participated in change processes. Indeed, *non-participation, pseudo-participation*, and more recently *virtual participation* are commonly practised within the

framework of intervention informed by the mechanistic-instrumental theory of action. People participate by being told about what is going to happen or what has already happened. The non-participatory practices assume that human relations are determined by the dichotomy between those who are able to think and those who are not. In this situation, the boundaries of, and the conditions for, participation have been already decided by some 'experts', who manipulate the results of those 'consultative processes' to accord with their theory of action and interests.

Liberal and *incentive-driven* forms of participation are more often practised under processes influenced by the economic-strategic theory of action. Presupposing that the rules, premises and promises of the dominant 'social system' are right, there is no discussion about the causes and consequences of such phenomena as globalisation, rural development, environmental sustainability, etc. Of course, a theory of action is not a matter of discussion.

Besides this, *functional participation* is observed within RR&D organisations informed by evolutionary-strategic theory of action. People participate by forming groups to meet predetermined objectives related to the donor's interest or program, which can involve the development or promotion of externally initiated intervention. Finally, *critical interactive participation* is promoted by authors and practitioners who have embraced a contextual theory of action and soft systems thinking. People participate in joint analysis, which leads to action plans and the formation of new local configurations of stakeholders or the strengthening of existing ones. Responsiveness and consciousness allow the actors to influence the decision-making and to commit themselves to their results and implications.

I recommend the practice of participatory action-reflection in facilitating institutional innovation. It assumes that effective institutional innovation depends on the commitment and understanding of those involved in the change process. Indeed, if people work together on a common problematic situation, knowing through negotiating perceptions, modes of interpretations, value frameworks and rules of participation, they will be more likely to change their minds if their critical inquiry indicates the kind of changes that are necessary. Also, it is suggested that Participatory Action Reflection can provide people with the motivation and support necessary to make transformational changes in their *praxis* which endure beyond the collective learning experience.

Development of strategies for institutional innovation

Strategists are influenced by their mode of interpretation, value framework, perception of the context, basis for interaction and rules of the game that they have incorporated into the theories of action. These *five elements* give reason to why they incorporate particular values, interests and commitments into their practice. The great strategists, old and contemporary, are better known by the theory of action that inspire their original, critical and creative thought, than by the instruments that they have applied. A theory of action defines which instruments are pertinent during the development of a strategy, not the opposite.

The complexity of the organisational reality, both internal and external, cannot be captured by reductionist approaches. Obviously, the ideal approach that includes all dimensions and aspects of the complexity of reality will never exist. Even if such an approach possibly did exist, it would not be used for the development of particular strategies, because it would be so general that it would not have any specific contribution to make. This is not the place to present all approaches or perspectives for the development of strategies, because this task had already been accomplished, among others, by Mintzberg *et al.,* (1998), Volverda & Elfring (2001), Whittington (2001) and De Souza Silva *et al*., (2001).

Within the New Paradigm projects, we have proposed the "contextual approach" for the development of strategies for institutional innovation. According to this approach, strategy is an alternative configuration - a particular arrangement of macro-steps - to mobilise the different groups of actions along converging axes towards the attainment of an objective (De Souza Silva et al., 2001).

The main premises of this perspective are influenced by the contextual theory of action for institutional innovation, and are:

- The development of strategies is a dialectic process of negotiation through social interaction in the context of their application and implications.
- The critical rule for an interactive perspective on the development of strategies is '*negotiation*', which must be present at all time during the process.
- Without negotiation there is no participation; without participation there is no interaction; and without interaction there is no innovation.
- The theory of action adopted by a team of strategists strongly influences the nature, course, and priorities of a strategy.

Considering that there are many possible configurations of actors, factors and actions to achieve the same objective, the development of a strategy (or the selection of an alternative configuration) is the result of ethical and political decisions at different times during the negotiation process.

The most important task during the development of strategies is the negotiation of:

- the theory of action within the framework in which the strategy will be developed;
- the purpose of the strategy;
- the associated internal and external contexts to the purpose of the strategy;
- the relevant actors for the success of the strategy (in the context);
- the relevant factors for the success of the strategy (in the context);
- the (macro) actions to articulate the relevant actors and factors;
- the internal consistency among the nature of the actions, the attitudes of the actors and the present state of the factors;
- the configurations - alternative and flexible - of macro-steps to accomplish groups of compatible actions; and
- the configuration of macro-steps that is technical, political, economic, institutional and ethically more pertinent.

These tasks within the development of organisational strategies for institutional innovation are indicative. Each context and the dynamics of each process can indicate the fusion of some of them, or the removal of others at more specific moments that are impossible to anticipate until the negotiated implementation of the proposed macro-steps.

8.8.2 Implications of research findings for capacity-building interventions

"When we had all the answers, the questions changed" (Aymara Indians, Andean Region)

Every society has a set of dominant rules of the game and an organisational configuration to operationalise them. These rules and configurations build on certain premises and basic assumptions and quietly reinforce the power and privilege that some groups or classes exercise

over others, based on asymmetrical power relationships and differentiated access to wealth. Moreover, the rules of the game are framed in a manner that seems to be natural and therefore generally applicable.

People who are interested in promoting rural development, community development or sustainable RRM, without questioning the predominant underlying premises and assumptions, assume that any problems lie in the implementation. Therefore, the rules of the game are considered to be correct, the implementation is corrupt, inefficient, or lacks strong leadership. The solution therefore lies in providing more of the same, but effectively and under the same rules. The focus is so much on "*practical actions*" while the beliefs, assumptions, rules and theories underlying the action are not even questioned.

What the cases studied in this research show is that if we want to change deeply held values, beliefs and assumptions that guide the way we think, decide and act, we need to uncover the deep configuration of the *five elements* of institutional innovation: *mode of interpretation, value frameworks, perception of the context, basis for interaction and rules of the game*. Without new organisational behaviour, and new attitudes informed by new theories of action, it would be practically impossible for organisations to become sustainable in the emerging epoch.

Therefore, new modes of interpretation, value frameworks and perceptions of the context, are critical organisational capacities towards organisational sustainability at a time of change of epoch. As a practical consequence, capacity-building projects and RR&D organisations that want to promote sustainable development by building local capacities must therefore adopt a multidimensional, inclusive theory of action for capacity building that necessarily develops not only instrumental skills, but also the intellectual abilities, and the definition of values and principles according to local historical and cultural realities and aspirations.

If capacity building for institutional innovation is to contribute to the strengthening of the organisational sustainability of RR&D organisations, then a new collaborative approach should be advanced beyond the "*fish and hook-giving*" models. In their search for organisational sustainability, RR&D organisations need neither fish nor hooks; they need to master the *art of hook-making* to develop and strengthen their conceptual, methodological and cultural capacities.

But, as we have been arguing, in a change of epoch, competing 'sets of rules', worldviews and theories of action for institutional innovation are struggling to prevail. In addition, as was shown in chapter 7, asymmetrical power relations influence collaboration processes and the definition of theories of action for institutional innovation in RR&D intervention.

As co-operation is not neutral, different ways of being, thinking, and acting lead to different modes of co-operation. Therefore, RR&D organisations in capacity-building intervention are at a political and ethical cross-roads:

- to support the implementation of a "market economy" in which society gets restructured to attend the needs of the market, organisations are seen as providers of information and technology and people are considered to be consumers instead of citizens; or
- to strengthen local capacities for establishing an 'economy' in which market is regulated to serve the needs of society, RR&D organisations are facilitators of change and development and people are citizens, whose talents are recognised and valued.

Independently of which of these alternatives matches our mode of interpretation and intervention (or surely there are other 'economies' that I have not considered), there is little doubt that we are

in the process of rethinking and renegotiating the rules of development at the local, regional and global levels. Therefore, people who maintain their hope that another world is possible require the development of intellectual, conceptual and cultural capacities to think outside-of-the box imposed by mainstream theories of action. Contextual-communicative theory of action for development interventions has the potential to support such efforts.

8.9 Back to my learning spiral

I started this book by analysing my learning spiral about institutional innovation through different career phases and working experiences. The learning spiral is based on Kolb's learning cycle that underpins personal and collective *praxis* and explains how people can learn from their experiences (see Figure 1.1). Starting with experience, then reflecting on it, analysing it, creating concepts, theory or explanations based on the understanding achieved, and confronting these in turn with practice in a specific context, knowledge is appropriated and re-configured through new experiences. It is by being deliberate and intentional about this process that one can maximise one's learning. In fact, this doctoral research allowed answering not only the guiding research questions, but also my personal questions as were explained in section 1.3.4 (see page 30).

Hence, for me the end of this learning cycle is the beginning of a new one. There are several fields in which the insights gained in this study can help to interpret and create understanding about, for example, the *praxeology* of agricultural technical innovation, the *praxeology* of rural resources management, the *praxeology* of M&E in rural development, etc. A few questions can be considered as starting points: (i) Is it possible to integrate different theories of action so that they work together in rural development interventions?; (ii) What for agricultural technical innovation are the implications of identified theories of action in this study?; (iii) What for RRM are the implications of the theories of action identified in this study?; (iv) How can critical learning communities on institutional innovation be promoted in grassroots organisations?; (iv) How can truly democratic networks be constructed, in which no one has the monopoly of information and the unilateral exercise of power?; (v) How can the process of institutional innovation be scaled up from the learning community, to the organisation and to the operational context?; and (vi) What kind of evaluation methodology do we need for institutional innovation under a contextual-communicative theory of action?.

Given the complexity and the different historical, social and cultural contexts of rural development interventions, the efforts towards answering these questions should include:

- networking with other social scientists and development practitioners;
- participating in public and academic debates about related issues;
- supporting social movements struggling for a new local, regional and global institutionality; and
- practising participatory action-reflection within different communities of practice for institutional innovation in agriculture and RRM.

I trust this book traced a promising beginning in the direction of new personal and collective learning experiences.

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Annexes

Annex 1

Guideline for interviews with IDIAP's national directors and research projects' managers.

1. What are the greatest challenges that IDIAP faces today?
2. How is IDIAP responding to these challenges?
3. Who are the actors of the national system of Science & Technology?
4. What are the mechanism or arrangement for co-ordination among these actors?
5. What changes are currently being implemented in your directorate?
6. What are the primary goals of agricultural research?
7. How is your directorate (centre, research project) organised for contributing to the attainment of these organisational goals?
8. How can IDIAP's stakeholders participate in IDIAP"s efforts towards technological change?
9. How can researcher participate in the changes that your directorate (or Centre) is implementing?
10. Are there any other issues concerning IDIAP process of change that you want to share with me?

Annex 2

Structured questionnaire for ENGOs in Panama

Formulario sobre Innovación Institucional en ONGs Conservacionistas en Panamá
Parte -1: Información General sobre la organización
01. Nombre de la Organización 02. Fecha de Constitución 03. Misión de la organización 04. Objetivos de la organización 05. Actividades a que se dedica la organización: Conservación, Gestión, Reforestación, Capacitación, Producción, Investigación, Facilitación,Asesoría Ecoturismo, Otras (Cuáles?) 06. Contexto de su actividad: (Local, Distrital, Provincial, Regional, Nacional Internacional) 07. Miembros de la organización según género: Hombres, mujeres 08. Miembros de la organización segun la edad: Hasta 18 años ___,19 a 30 años___, 31 a 45 años___, 46 a 60 años___, mas de 61 años___ 09. Nivel de escolaridad de los socios (señale la cantidad por categoría) Primaria, Secundaria, Técnico medio, Licenciatura, Postgrado, Maestría Doctorado, Post doctorado 10. Personas contratadas permanentemente en la organización: tiempo completo, medio tiempo, Otros arreglos (Cuáles?) 11. Personas contratadas temporalmente en la organización: Administrativos/año, Consultores/año, Otros 12. Con cuáles organizaciones mantiene relaciones permanentes de intercambio de información y colaboración para: Nombre de la Organización y Mecanismo de coordinación (comité, junta directiva, consejo consultivo, etc.) 13. Que tipo de arreglo institucional ha surgido como resultado de estas relaciones

organizaciones conservacionistas? (Asociación, Federación, Red, etc.)

14. Proyectos ejecutados por la organización en los últimos 5 años: Fecha de ejecución, Fuente de financiamiento y monto de la inversión.

Parte-2: Información sobre cambios e innovaciones institucionales recientes

15. Señale los cambios mas importantes efectuados en la organización en los últimos 5 años, en los siguientes aspectos:
    - Estructura y procesos organizativos
    - Base programática (misión, objetivos, políticas, estrategias, etc,)
    - Productos y servicios que ofrece
    - Enfoques teóricos y metodológicos orientadores adoptados por la organización
    - Modo de intervención (Asistencia o Transf. de Tecnología, Facilitación, etc.)
    - Sistema de Planificación, Seguimiento y Evaluación
    - Modelo de Gestión utilizado para pensar, decidir y actuar como organización
    - Otros cambios
16. Cómo y dónde se tomó la decisión de realizar estos cambios?
    a) Por consenso, Por votación, b) En la junta directiva, En asamblea general
    Otra forma y/o instancia (Cuál?)
17. De donde provino la información para los cambios implementados:
    Propuesta de los socios Experiencia propia de otra ONG
    De los donantes del servicio público de Internet
    otra fuente (Cual?)
18. Apoyo externo recibido para el cambio organizacional :
    Seminarios
    Intercambio con otras organizaciones
    Subsidios o donaciones
    Consultorías especializadas
    Otros (Cuáles?)
19. Como han ayudado los cambios efectuados al desempeño de la organización:
    Mayor acceso a fuentes de financiamiento o donación
    Mayor reconocimiento social
    Productos y/o servicios mas pertinentes
20. Propuestas de cambio que no han sido implementadas por la organización
21. Razones por las cuales no se han implementado
22. Origen de la(s) propuesta(s) no implementadas:
    Propuesta de los socios, Experiencia propia, de otra ONG, De los donantes, del servicio público, de Internet, Otra fuente (Cuál?)
23. Que tipo de apoyo requiere su organización para el desarrollo y fortalecimiento de capacidades que eleven su grado sostenibilidad institucional?
24. Cuál es el principal problema o desafío que enfrentan las ONGs conservacionistas en la actualidad?
25. Cómo visualiza su organización dentro de 15 años?

Annex 3

Guideline for interview with managers and facilitators of ENGO institutional strengthening programs.

Guía para Entrevistas sobre Programas de Fortalecimiento Institucional de ONGs Ambientalistas en Panamá .

1. Cuál será la mayor contribución del programa de FI en relación con las ONG ambientalistas en Panamá?
2. Cómo podría usted resumir la "teoría de acción" del Programa de FI?
3. Cómo determina el programa de FI sus productos y servicios?
4. Qué enfoque o teoría ha adoptado el programa de FI sobre el modo de generación y apropiación del conocimiento por parte de los beneficiarios?
5. Cuáles son los componentes principales del programa de FI?
6. Qué tipo de estrategias metodológicas de aprendizaje utiliza el programa?
7. Cómo participan los beneficiarios del FI en la definición de sus marcos orientadores, objetivos, estrategias y políticas del programa?
8. Qué tipo de capacidades institucionales se espera desarrollar o fortalecer con el programa de FI?
9. Qué factores afectan positiva o negativamente el logro de los objetivos del programa de FI?
10. Qué lecciones se podrían derivar a la fecha de las acciones realizadas por el programa de FI?
11. Tiene alguna otra información sobre el programa de FI que le gustaría compartir con nosotros

Annex 4

Guideline for interviews with ISNAR managers in The Hague, and with the NP management team.

Considering that you, at some point in time, participated in NPP activities, or you have been related to the management of the project in some way, it is very important for me to know your perception about the institutional change of the project. So, I will very much appreciate if you can share with me your opinion concerning the following questions:

1. Which is the greatest contribution of the NP project to the accomplishment of ISNAR"s mission?
2. What aspect of the NP project's "theory of action" seems to be more important to you? Why?
3. What characteristics of the "mode of intervention" of the NP Project do you consider is the most relevant? Why?
4. What does the NP Project does different if compared with other ISNAR's capacity-building projects?

5. If I ask you to represent the NP project by means of a metaphor, which one you would use?
6. Which are the three most positive aspects or characteristics of the NPP?
7. Which are the three most negative aspects or characteristics of the NPP?
8. How has changed the NP project since you know it?
9. How should change the NP project to make a greater and better contribution to the development of capacities for institutional innovation?
10. How do you imagine the future of the NP project?
11. Are there any other issues concerning NP project process of change that you want to share with me?

Specific additional questions for interviews with the NP project management team.

1. Cómo ha variado el número y las cualidades de los profesionales asociados al PNP desde 1992 al 2001?
2. Cómo han variado las fuentes y el monto del financiamiento al PNP desde 1992 al 2001?
3. Cómo ha variado el número y tipo de organizaciones con las cuales trabaja el PNP desde 1992 al 2001?
4. Cómo ha variado la teoría de acción del proyecto NP en sus diferentes fases?
5. Qué hace al proyecto NP diferente de otros proyectos o esfuerzos de desarrollo de capacidades?
6. Cuáles han sido los factores impulsores más importantes para el desempeño del PNP?
7. Cuáles han sido los factores restrictivos más importantes para el desempeño del PNP?
8. Qué lecciones se pueden derivar de la gestión de los factores impulsores/restrictivos?
9. Cómo debería cambiar el proyecto NP para hacer una mayor y mejor contribución al desarrollo de capacidades para la innovación institucional?
10. Cómo se imagina Usted el futuro del PNP?
11. Hay alguna anécdota relacionada con su participación en el PNP que quisiera compartir con nosotros?

Annex 5

Guideline for interviews with regional facilitators and other associated professionals within the NP project

Usted ha estado vinculado al proyecto Nuevo Paradigma (o al PS&E), durante este proceso de cambio institucional, de ahí que para mi es extremamente importante contar con su opinión, para lo cual le agradezco compartir sus respuestas a las siguientes preguntas:

Datos generales:
Profesión:
Formación académica:
Ocupación actual:
Area de especialidad:
Lugar(es) donde labora actualmente:

1. Desde cuándo esta relacionado con el PNP y cómo comenzó esa relación?
2. Cuál es su función en el PNP? ¿Cómo ha cambiado esa función con el tiempo?
3. Cómo se beneficia usted de la relación con el PNP?
4. Cómo cree Usted que el PNP se beneficia con su participación?

5. Cómo ha influido su vinculación con el proyecto en su vida profesional?
6. Qué aspecto de la marco conceptual del proyecto le parece más importante? Porqué?
7. Qué aspecto del modo de intervención del PNP le parece más importante? Porqué?
8. Qué hace al PNP diferente de otros proyectos o esfuerzos de desarrollo de capacidades?
9. Si tuviese que representar al PNP mediante una metáfora, cuál utilizaría?
10. Cómo ha cambiado el PNP desde que usted lo conoce?
11. Cómo debería cambiar el PNP para hacer una mayor y mejor contribución al desarrollo de capacidades para la innovación institucional?
12. Cómo se imagina Usted el futuro del PNP?
13. Hay alguna anécdota relacionada con su participación en el PNP que quisiera compartir con nosotros?

Summary

This study was carried out to critically examine the state of the art of institutional innovation and to identify the theories of action informing it in rural research and development (R&D) organisations. The general aim of this study is to better understand the processes, under which theories of action for management and facilitation of institutional innovation are generated, reconfigured and appropriated by participant actors. The purpose is to contribute to the construction of a new theory of action for the management and facilitation of institutional innovation in rural R&D organisations.

The following general research questions were formulated to guide the process of inquiry: (i) What are the main theories of action that inform the processes of institutional change and innovation in rural R&D organisations?; (ii) How does institutional change in rural R&D organisations reflect the contradictions of the change of epoch and the development of a new paradigm of institutional innovation?; (iii) How do change agents develop and deploy alternative theories of action in such a way that they can overcome the limitations imposed by the mainstream?; (iv) How are institutional innovation processes affected by (and how do they affect) the theories of action of donors and external facilitators?; and (v) What are the external and internal factors facilitating (or hampering) the institutional innovation process in rural R&D organisations?

The study was carried out in three cases. The selected case studies are different in their organisational configuration and in the scope of their interventions. On the other hand, they are similar with regard to their basic function as rural R&D organisations, aiming to contribute to rural development. The three studied cases were:

- **The National Agricultural Research Institute of Panama**: It is a public R&D organisation in charge of agricultural research and responsible for 'transferring' its results to extension agents. The extension service in Panama is part of the Ministry of Agricultural Development (MIDA).
- **Environmental NGOs in Panama**: Considering the role that NGOs have been occupying in the rural R&D effort and the voluntary character of their membership, two ENGOs that have received support from the USAID's and NATURA's institutional strengthening programs were studied: FUNDICCEP and APASAN.
- **The ISNAR New Paradigm project**: It is a capacity-building project carried out by ISNAR in LAC. Working with pilot cases at the regional level, mainly of agricultural science and technology organisations, the project has not only supported institutional change processes, but has also innovated itself.

The methodological strategy was based mainly on qualitative methods, such as: participatory action-reflection, in which the roles of the researcher-observer and of the actor-facilitator in the researching system are intertwined. Participants are involved in collective action and reflection through the negotiated interpretation of the processes, from which lessons are derived to transform perceptions, decisions and actions. In addition, interpretative content analysis was the guiding method for analysing organisational documents that were considered to be a product of social construction.

According to the analysis of the context of institutional innovation presented in the second chapter, there is evidence to show that the ongoing changes in the rural context are a situated expression of an on-going change of epoch. While the new epoch establishes itself, the current

rules of the development experience a crisis of legitimacy and individual and collective actors experience a crisis of perception and interpretation. Under these circumstances, it is impossible to get out of the organisational vulnerability under the same rules of the game, worldviews and theories of action, which have created it.

In the third chapter the state of the art of institutional innovation is presented and discussed. Outcomes of this review indicate that innovation in the rural milieu is no longer the outcome of applying a science focused on delivering "*the best technical means*" to achieve the given goals of productivity and competitiveness. Instead of just being the product of fundamental and/or applied research by agricultural scientists, innovation is increasingly seen as the emergent property of the interaction among not only researchers, extension workers and farmers, but also increasingly concerned NGOs, other resource users, consumers and industries, among others.

According to the study, there is always more than one way to achieve the same purpose and therefore there is always more than one theory of action to inform it. A theory of action is defined as: *a set of principles of behaviour, shaped by paradigms, worldviews, theoretical and methodological premises to inform the way a given organisational purpose must be achieved in an effective way*. Different theories of action reveal different values, meanings and interests that are reflected in the principles, premises, promises and commitments that mould the practices that they inform. The study of the different theories of action that inform institutional innovation processes is referred to in this research as the *praxeology of institutional innovation*. The *praxeology of institutional innovation* within the three case studies is presented in chapters 5, 6 and 7. For each studied case, a specific research design and set of questions are followed.

The analytical synthesis of the three case studies is presented in chapter 8. An alternative explanatory model of institutional innovation including the interrelationships of the organisational *mode of interpretation*, *value frameworks*, *perception of the context*, *basis for interactions* and *internal rules of the game* is proposed. These five elements tend to be internally and externally consistent. The requisite for internal consistency is called *institutional coherence* and its external consistency with the external operational context is defined as the *correspondence* requisite. The proposed model is used for the analyses of the three studied cases. Regarding the main objective of the study, two sets, each comprising two theories of action, were identified:

(1) Two well-established theories of action called here *mechanistic-instrumental* and *economic-strategic*. Under these theories of action, institutional innovation is a deliberate, explicit, simple and controlled process of searching for new opportunities for conceiving new strategies, and for implementing changes in the organisation's products and services; and
(2) Two emergent theories of action for institutional innovation in rural R&D organisations were identified: *evolutionary-strategic* and *contextual-communicative* theories of action.

Additionally, the cases studied in this research reveal the great organisational vulnerability that characterises rural R&D organisations. In order to reverse their vulnerability, these organisations are struggling to build a new basis for their sustainability. Nevertheless, most of them have not overcome their crisis of perception and interpretation as a result of "*blinding insights*" created by theories of action that informed their praxis for institutional innovation and the ongoing fragmentation of the rules of development within their operational context.

As part of the research findings it is argued that institutional innovation processes of rural R&D organisations under contextual-communicative theory of action should go through the following tasks:

- **Past-present (de)construction**: an analysis of premises and underlying assumptions behind their current theory of action, to know what involved actors need to *unlearn*;
- **Present-future (re)construction:** collective construction of new premises and assumptions that will undergird the new theory of action - what involved actors need to *learn*; and
- The initiative of institutional innovation should be linked to **practice** through debating, networking and sharing with local actors in rural R&D interventions**.** That is, it should be motivated neither by academicism nor by dilettantism, but by social commitment, with its implications for individual and organisational *praxis.*

On the basis of research findings some recommendations for organisational praxis under contextual-communicative theory of action are offered. In particular, is pointed that the effort towards double- and triple-loop learning under a contextual theory of action would benefit from the following practices:

- the identification of existing learning communities within rural R&D organisations and creation and strengthening of communities of practice for organisational learning on institutional innovation;
- the application of collective construction and the appropriation of knowledge framework, starting from the systematisation of the local experiences considering the active participation of local actors;
- the linking of the organisational learning efforts with necessities, realities, priorities and aspirations of local actors;
- the use of interpretative questions to stimulate the development of critical and creative thought in organisational learning efforts;
- the creation of *Ágoras* for interaction, critical reflection and discovery learning;
- the stimulation of the emergence and development of local leaders for institutional innovation; and
- the participation of multiple organisational actors in the design, implementation and evaluation of learning activities.

The reported study concludes with some implication of research findings for capacity-building interventions in rural development. In particular is argued that if capacity building for institutional innovation is to contribute to the strengthening of the organisational sustainability of rural R&D organisations, then a new collaborative approach should be advanced beyond the "*fish and hook-giving*" models. In their search for organisational sustainability, rural R&D organisations need neither fish nor hooks; they need to master the *art of hook-making* to develop and strengthen their conceptual, methodological and cultural capacities.

Resumen

Este estudio fue realizado para examinar críticamente el estado del arte de la innovación institucional y para identificar las teorías de acción que la orientan en organizaciones de I&D rural. El objetivo general de este estudio es entender mejor los procesos, mediante los cuales las teorías de acción para la gestión y la facilitación de la innovación institucional son generadas, (re)configuradas y apropiadas por los participantes. El propósito es contribuir a la construcción de una nueva teoría de acción para la gestión y la facilitación de la innovación institucional en organizaciones de I&D rural.

Las siguientes preguntas generales fueron formuladas para dirigir el proceso de investigación: (i) cuáles son las principales teorías de acción que orientan los procesos cambio e innovación institucionales en organizaciones de I&D rural?; (ii) cómo los procesos de cambio institucional en organizaciones de I&D rural reflejan las contradicciones del cambio de época y del desarrollo de un nuevo paradigma para la innovación institucional?; (iii) cómo los agentes de cambio desarrollan y despliegan teorías de acción alternativas de una manera que superan las limitaciones impuestas por las teorías de acción hegemónicas?; (iv) cómo son los procesos de innovación institucional afectados por (y cómo ellos afectan) las teorías de acción de los donantes y facilitadores externos?; y (v) cuáles son los factores externos e internos que facilitan (o restringen) el proceso de innovación institucional en organizaciones de I&D rural?.

El estudio fue realizado en tres casos. Los estudios de caso seleccionados son diferentes en su configuración organizacional y en el alcance de sus intervenciones. Por otra parte, son similares con respecto a su función básica como organizaciones de I&D con la misión de contribuir al desarrollo rural. Los tres casos estudiados fueron:

- **El Instituto de Investigación Agropecuaria de Panamá**: El IDIAP es una organización pública de I&D a cargo de investigación agropecuaria y responsable de 'transferir' sus resultados a los agentes de la extensión. El servicio de extensión en Panamá es parte del Ministerio de Desarrollo Agropecuario (MIDA).
- **ONGs ambientalistas en Panamá**: En vista del papel que los ONGs han estado ocupando en los esfuerzos de I&D rural y el carácter voluntario de su membresía, dos ONGs ambientalistas que han recibido el apoyo de programas de fortalecimiento institucional de USAID's y de NATURÁs fueron estudiadas: FUNDICCEP y APASAN.
- **El proyecto ISNAR Nuevo Paradigma**: El proyecto NP es un proyecto del construcción de capacidades para la innovación institucional ejecutado por ISNAR en América Latina y El Caribe. Trabajando con los casos piloto a nivel regional, principalmente con organizaciones de ciencia y tecnología agropecuaria, el proyecto no sólo ha apoyado sus procesos de cambio institucional, sino también se ha innovado a sí mismo.

La estrategia metodológica fue basada principalmente en métodos cualitativos, por ejemplo: la **acción-reflexión participativa**, en la cual los roles del investigador-observador y de actor-facilitador en el sistema a investigar están entrelazados. Los participantes están involucrados en la acción y reflexión colectivas a través de la interpretación negociada de los procesos, de los cuales se derivan lecciones para transformar percepciones, decisiones y acciones. Además, el **análisis interpretativo del contenido** fue el método de guía para analizar los documentos organizacionales que fueron considerados como resultado de procesos de construcción social.

Según el análisis del contexto de la innovación institucional presentado en el segundo capítulo, hay evidencias que demuestran que los cambios en curso en el ámbito rural son una expresión situada del actual cambio de época histórica en curso. Mientras que la nueva época se establece, las reglas actuales del desarrollo experimentan una crisis de la legitimidad y los agentes

individuales y colectivos experimentan una crisis de percepción e interpretación. Bajo estas circunstancias, es imposible salir de la vulnerabilidad organizacional bajo las mismas reglas del juego, visión de mundo y teorías de acción, que la crearon.

En el tercer capítulo el estado del arte de la innovación institucional se presenta y se discute. Los resultados de esta revisión indican que la innovación en el contexto rural ya no es mas el resultado de aplicar una ciencia centrada en entregar "el mejor medio técnico" para alcanzar las metas de productividad y competitividad. En lugar de ser solamente el producto de la investigación básica y/o aplicada de los científicos agrícolas, la innovación cada vez más es comprendida como una propiedad emergente de la interacción no solamente entre investigadores, extensionistas y productores, sino también que de manera creciente incluye a las ONGs, otros usuarios de los recursos rurales, consumidores y agroindustriales, entre otros.

Según el estudio, hay siempre más de una forma para alcanzar el mismo propósito y por lo tanto existe siempre más de una teoría de acción para orientarle. Una teoría de la acción se define como: *un conjunto de principios de comportamiento, moldeados por paradigmas, visiones de mundo, premisas teóricas y metodológicas para orientar la manera en que un propósito organizacional dado se debe alcanzar de manera eficaz*. Diversas teorías de acción revelan los diversos valores, significados e intereses que se reflejan en los principios, premisas, promesas y compromisos que moldean las prácticas que orientan. El estudio de las diversas teorías de la acción que orientan los procesos de innovación institucional se define en ésta investigación como la *praxeología de la innovación institucional*. La praxeología de la innovación institucional en los tres estudios de caso se presenta en los capítulos 5, 6 y 7. Para cada caso estudiado se sigue un diseño de investigación y un conjunto específico de preguntas de investigación.

La síntesis analítica de los tres estudios de caso se presenta en el octavo capítulo. Se propone como alternativa analítica un modelo explicativo de la innovación institucional que incluye las interrelaciones entre el modo de interpretación, los marcos valorativos, la percepción del contexto, las interacciones y las reglas internas del juego de una organización. Estos cinco elementos tienden a ser internamente y externamente consistentes. El requisito de consistencia interna se le denomina *coherencia institucional* y su consistencia externa con el contexto operacional se define como el requisito de la *correspondencia*. El modelo propuesto se utiliza para el análisis consolidado de los tres casos estudiados. Con respecto al objetivo principal del estudio, dos conjuntos, cada uno de los cuáles comprende dos teorías de acción, fueron identificados:

(1) dos teorías de acción establecidas, llamadas aquí *mecanicista-instrumental* y *economicista-estratégica*. Bajo estas teorías de acción, la innovación institucional es un proceso deliberado, explícito, simple y controlado de búsqueda de nuevas oportunidades, de formulación de nuevas estrategias, y de poner en ejecución cambios en los productos y los servicios de la organización; y
(2) Dos teorías de acción emergentes para la innovación institucional en organizaciones de I&D rural: *evolucionista-estratégica* y *contextual-comunicativa*.

Además, los casos estudiados en esta investigación revelan la gran vulnerabilidad que caracteriza a las organizaciones de I&D rural. Para revertir su vulnerabilidad, estas organizaciones están luchando para construir una nueva base para su sostenibilidad. Sin embargo, la mayoría de ellas no han superado sus crisis de percepción e interpretación como resultado de sus "*puntos ciegos*" creados por las teorías de la acción que moldearon su *praxis* para la innovación institucional y por la fragmentación de las reglas del desarrollo en su contexto operacional.

Como parte de los resultados de la investigación se argumenta que los procesos de innovación institucional de las organizaciones de I&D rural orientados por la teoría acción contextual-comunicativa debería cumplir las siguientes tareas:

- **(de)construcción de su pasado-presente**: un análisis de las premisas y suposiciones subyacentes detrás su teoría de acción actual, para conocer qué necesitan desaprender los agentes involucrados en el procesos de innovación;
- **(re)construcción de su presente-futuro**: construcción colectiva de las nuevas premisas y de las suposiciones que moldearán la nueva teoría de la acción – para conocer qué necesitan aprender los agentes involucrados en el procesos de innovación; y
- la iniciativa de innovación institucional se debe ligar a la **práctica** debatiendo, estableciendo redes y compartiendo con los agentes locales en intervenciones de I&D rural. Es decir, debe ser motivado no por el academicismo ni por el diletantismo, sino por el compromiso social, con sus implicaciones para la *praxis* individual y colectiva.

En base de resultados de la investigación se ofrecen algunas recomendaciones para la *praxis* organizacional orientada por la teoría de acción contextual-comunicativa. En particular, se enfatiza que el esfuerzo hacia el aprendizaje en 'doble bucle' y el aprendizaje epistémico orientados por la teoría de acción contextual-comunicativa se beneficiaría de las siguientes prácticas:

- Identificación de comunidades de aprendizaje existentes en las organizaciones de I&D rural y creación y consolidación de comunidades de práctica para el aprendizaje organizacional sobre innovación institucional;
- construcción y apropiación colectiva de conocimiento, iniciando con la sistematización de las experiencias locales y considerando la participación activa de los actores locales;
- ligar los esfuerzos de aprendizaje organizacional a las necesidades, realidades, prioridades y aspiraciones de los actores locales;
- uso de preguntas interpretativas para estimular el desarrollo del pensamiento crítico y creativo en los esfuerzos de aprendizaje organizacional;
- la creación de los *Ágoras* para la interacción, la reflexión crítica y el aprendizaje por descubrimiento;
- estímulo a la aparición y desarrollo de líderes locales para la innovación institucional; y
- estimular la participación de múltiples actores organizacionales en el diseño, la puesta en práctica y la evaluación de actividades de aprendizaje.

El estudio divulgado concluye con algunas implicaciones de los resultados de la investigación para las intervenciones construcción de capacidades para el desarrollo rural. En particular, se argumenta que si la construcción de capacidades para la innovación institucional debe contribuir a la consolidación de la sostenibilidad de las organizaciones de I&D rural, entonces un nuevo enfoque de colaboración debe superar los modelos que entregan el "*pescado*" o el "*anzuelo*". En su búsqueda por sostenibilidad organizacional, las organizaciones de I&D rural no necesitan ni pescados ni anzuelos, necesitan dominar el "*arte de hacer anzuelos*" para desarrollar y para consolidar sus capacidades conceptuales, metodológicas y culturales.

Samenvatting

Deze studie gaat over Research en Development organisaties die bezig zijn rurale ontwikkeling (RR&D). De studie werd uitgevoerd om de huidige stand van zaken van institutionele innovatie binnen deze organisaties te bestuderen en de onderliggende actietheorieën te identificeren. Het doel van de studie is een beter begrip te krijgen van de processen, waaronder deze actietheorieën worden gegenereerd, ge(her)ordend en eigengemaakt door de participerende actoren. Hiermee hoopt men bij te dragen aan de constructie van een nieuwe actietheorie voor het management en het faciliteren van institutionele innovatie in R&D organisaties voor rurale ontwikkeling. Om het onderzoeks proces te leiden werden de volgende algemene onderzoeksvragen geformuleerd: (i) Wat zijn de belangrijkste actietheorieën, die de veranderings- en innovatieprocessen in RR&D organisaties oriënteren?; (ii) Hoe weerspiegelt institutionele verandering in RR&D organisaties de tegenstellingen tussen de veranderende tijdsgeest en de ontwikkeling van een nieuw paradigma voor institutionele verandering?; (iii) Hoe ontwikkelen de actoren de verschillende actietheorieën en hoe passen ze op zo'n manier toe, dat ze de beperkingen die opgelegd worden door de 'mainstream' overwinnen?; (iv) Hoe worden institutionele innovatie processen beïnvloedt door (en hoe beïnvloeden zijzelf) de actiethoerieën van donoren en externe facilitatoren?; en (v) Welke externe en interne factoren helpen (of hinderen) het institutionele innovatie proces in RR&D organisaties?

De studie werd uitgevoerd door middel van drie cases. De geselekteerde case-studies verschillen in hun organisatorische configuratie en in de reikwijdte van hun interventies. Aan de andere kant zijn ze gelijksoortig wat betreft het feit dat hun funktie als RR&D organisatie hun basis vormt, met als doel het bijdragen aan rurale ontwikkeling. De drie bestudeerde cases waren:

- Het Panameese Nationaal Agrarisch Onderzoeks Instituut: Het is een R&D organisatie van de overheid, belast met landbouwkundig onderzoek en verantwoordelijk voor het "overdragen" van de resultaten aan voorlichtingsinstanties. De Panameese voorlichtingsdienst valt onder het Ministerie van Landbouwontwikkeling (MIDA).
- Milieu NGOs in Panama: Rekening houdend met de rol die NGOs hebben gespeeld in RR&D pogingen en met het vrijwillige karakter van hun lidmaatschap, zijn twee Milieu NGOs bestudeerd die beiden institutionele ondersteuning hebben ontvangen van USAID en van NATURA: FUNDICCEP en APASAN.
- Het ISNAR New Paradigm projekt: Dit is een capacity-building projekt dat uitgevoerd wordt door ISNAR in Latijns Amerika en het Carribisch gebied. Het projekt dat werkt met pilot cases op regionaal niveau, met voornamelijk landbouwkundige (wetenschappelijke en technisch) organisaties, heeft niet alleen institutionele veranderingsprocessen ondersteund, maar heeft ook zichzelf vernieuwd.

De methodologische strategie was voornamelijk gebaseerd op kwalitatieve methoden, zoals: participatieve actie-reflectie, waarbij de rol van onderzoeker-observeerder en die van actor-facilitator in het onderzoeks systeem met elkaar verweven waren. De deelnemers zijn betrokken bij de collectieve actie en reflectie door de in onderhandeling zijnde interpretatie van het process. Hieruit worden dan weer lessen gehaald om de percepties, beslissingen en acties te transformeren. Verder werd interpretatieve inhoudsanalyse gebruikt als methode voor het analyseren van schriftelijk materiaal van de organisaties, dat werd beschouwd als een product van sociale constructie.

De analyse van de context van institutionele innovatie, die gepresenteerd wordt in het tweede hoofdstuk, laat zien dat er bewijs is dat de voortdurende veranderingen in de rurale context een

uitdrukking zijn van een in gang zijnde verandering van de tijdsgeest. Terwijl de nieuwe tijdsgeest zichzelf vestigt, ondergaan de huidige regels van ontwikkeling een crisis van legitimiteit en individuele en collectieve actoren ondergaan crisis van perceptie interpretatie. Onder deze omstandigheden is het onmogelijk dat organisaties uit hun kwetsbare positie komen, wanneer de spelregels, wereldvisies en actietheorieën die deze kwetsbaarheid creëerden, dezelfde blijven.

In het derde hoofdstuk wordt de huidige stand van zaken van institutionele innovatie gepresenteerd en besproken. Het resultaat van dit overzicht laat zien dat innovatie in het rurale milieu niet langer het resultaat is van een wetenschap die gefocused is op het leveren van "de beste technische middelen" om productiedoelstellingen te bereiken of competentie te verhogen. Innovatie wordt niet langer meer gezien als slechts het product van fundamenteel of toegepast onderzoek van landbouwwetenschappers, maar steeds meer als iets dat voortkomt uit de interactie tussen niet alleen onderzoekers, voorlichters en boerenbevolking, maar ook steeds meer met onder andere betrokken NGOs, andere gebruikers, consumenten, industrieën.

Volgens deze studie is er altijd meer dan één weg om hetzelfde doel te bereiken en daarom is er altijd meer dan één actietheorie om het te oriënteren. Een actietheorie wordt gedefinieerd als: *een stelsel van gedragsprincipes, vormgegeven door paradigmas, wereldvisies, theorethische en methodologische premisses om richting te geven aan hoe een gegeven organisatorisch doel op een effectieve manier bereikt kan worden*. Verschillende theorieën komen tot uitdrukking in verschillende waarden, betekenissen en interesses, die worden weerspiegeld in principes, aannames, beloftes en commitments die vorm geven aan de praktijk die zij richting geven. Aan de studie van de verschilllende actietheorieëen die institutionele innovatieprocessen informeren, wordt hier gerefereerd als de *praxeologie van institutionele innovatie*. In hoofdstuk 5, 6 en 7 wordt de *praxeologie van institutionele innovatie* van de drie case studies gepresenteerd. Voor iedere case studie wordt een specifiek onderzoeksontwerp en specifieke onderzoeksvragen gevolgd.

Hoofdstuk 8 geeft de analytische synthese van de drie case studies weer. Hier wordt een alternatief verklarend model van institutionele innovatie gepresenteerd, waarin ook is opgenomen de interrelatie tussen de *wijze van interpreteren*, *het raamwerk van waarden*, *de perceptie van de context*, *de basis van de interacties* en *de interne spelregels* van de organisatie. Deze vijf elementen vertonen de nijging intern en extern consistent te zijn. *Institutionele coherentie* refereert naar de eis van interne consistentie en de externe consistentie met de externe operationele context wordt gedefinieerd als de eis van *correspondentie*. Het voorgestelde model wordt gebruikt om de drie cases te analyseren. Wat betreft het hoofddoel van de studie, het bijdragen aan de constructie van een nieuwe actietheorie, zijn er twee groepen geïdentificeerd die ieder weer uit twee actietheorieëen bestaan:

(1) Twee gevestigde actietheorieën, de zogenaamde *mechanistisch-instrumentele* en de *economisch-strategische*. Volgens deze actietheorieën is institutionele innovatie een weloverwogen, expliciet, simpel en gecontroleerd proces van zoeken naar nieuwe mogelijkheden om nieuwe strategieën uit te werken en om veranderingen teweeg te brengen in de producten en diensten van de organisatie.
(2) Twee opkomende actietheorieën voor institutionel innovatie in RR&D organisaties werden geïdentificeerd: de *evolutionair-strategische* en de *contextueel-communicatieve* actietheorie.

De case studies in dit onderzoek brengen de grote organisatorische kwetsbaarheid die RR&D organisaties karakteriseerd, aan het licht. Om deze kwetsbaarheid te verminderen, zijn deze

organisaties druk bezig een nieuwe basis te bouwen voor hun duurzaamheid. Niettemin zijn de meesten nog niet over de perceptie en interpretatiecrisis heen, als gevolg van "verblindende inzichten" gecreëerd door actietheorieën die hun praxis van institutionele innovatie oriënteert en als gevolg van de voortdurende fragmentatie van de regels van ontwikkeling binnen hun operationele context.

Als onderdeel van de onderzoeksresultaten wordt aanbevolen dat institutionele innovatie processen van RR&D organisaties, hierbij de contextueel-communicatieve actietheorie volgend, de volgende taken doorwerkt:

- **Verleden-heden (de)constructie**: een analyse van premisses en onderliggende veronderstellingen achter hun huidige actietheorie, zodat men weet wat de betrokken actoren moeten *ont-leren*;
- **Heden-toekomst (re)constructie**: collectieve constructie van nieuwe premisses en veronderstellingen die de nieuwe actietheorie zullen onderbouwen, zodat men weet wat de betrokken actoren moeten *leren*; en
- Het initiatief van institutionele innovatie moet verbonden zijn met de **praktijk** door debat, netwerken en door het delen van ervaringen met RR&D interventies met locale actoren. Dat wil zeggen, het moet niet ingegeven worden door de wetenschap, nog door hobbyisme, maar door sociaal commitment, met zijn implicaties voor zowel de individuele als de organisatorische *praxis*.

Op grond van de onderzoeksresultaten kunnen de volgende aanbevelingen gedaan worden voor organisatorisch praxis onder de contextueel-communicatieve actietheorie. Er wordt met name op gewezen dat double- en triple-loop leerprocessen, zoals bedoeld in de contextuele actietheorie, vooral gebaat zouden zijn met de volgende activiteiten:

- Het identificeren van bestaande groepen die al bezig zijn met een leerproces binnen de RR&D organisaties en het creëren en versterken 'communities of practice' die bezig zijn met leerprocessen over institutionele innovatie;
- Collectieve constructie en het collectief eigen maken van kennis, te beginnen bij het systematiseren van de locale ervaringen waarbij locale actoren actief betrokken zijn.
- Het verbinden van de inspanningen van de organisatie om te leren met de behoeften, realiteiten, prioriteiten en aspiraties van de locale actoren.
- Het gebruik van interpretatieve vragen om het ontwikkelen van kritisch en creatief denken in het organisatorisch leerproces te stimuleren.
- Het creëren van *Agoras* voor interactie, kritische reflectie en ontdekkend leren.
- Het stimuleren van het naar voren halen en ontwikkelen van locale leiders voor institutionele innovatie en
- De participatie van meerdere organisatorische actoren in het ontwerp, de implementatie en de evaluatie van leeractiviteiten.

De onderhavige studie eindigt met enkele gevolgtrekkingen uit de onderzoeksbevindingen voor capacity-building-interventies in rurale ontwikkeling. Met name wordt beargumenteerd, dat als capacity building voor institutionele innovatie moet bijdragen aan de versterking van de organisatorische duurzaamheid van RR&D organisations, dat dan een nieuwe collaboratieve benadering nodig is die verder gaat dan de "*fish and hook-making*" modellen. In hun zoektocht naar organisatorische duurzaamheid, hebben RR&D organisaties, noch *fish*, noch *hooks* nodig; Wat zij nodig hebben is de kunst om de *hooks* zelf te maken om hun conceptuele, methodologische en culturele capaciteiten te ontwikkelen en te versterken.

About the Author

Julio Santamaria Guerra, was born at Boquerón, Chiriquí in Panama, on July 13 1954. He obtained his BSc degree in Agronomy and his first MSc in Agriculture in 1981 from the Patrice Lumumba People's Friendships University in Moscow. After that, he was employed by the National Agricultural Research Institute of Panama (IDIAP) as regional co-ordinator of transfer of technology and later promoted to the head of national training department in which he worked until 1985 when he went to Brazil for postgraduate studies. In 1987 He completed his second MSc in Rural Economy at Federal University of Paraiba in Brazil and returned to work in IDIAP as researcher until December 1989. He is consultant with national and international experience for the joint agricultural division CEPAL/FAO, the CATIE and World Bank and the ISNAR and occupied directive positions in co-operatives, private companies and the agricultural public sector in Panama. He has been university lecturer at Technological University of Panama and at Faculty of Agrarian Sciences (National University of Panama) and has ample experience in adult training. Julio was the co-ordinator of the formulation of the Strategic Plan of Panamanian Agricultural Science, Technology and innovation and was the leader of the process of institutional change of the IDIAP during 1995 - 1998. Santamaria is author of a substantial number of publications related to Panamanian agriculture and to the management of institutional innovation. He forms part of the regional team of facilitators of the ISNAR New Paradigm network in the areas of management of institutional change, development of organisational strategies for innovation and strategic planning. In 1999, Julio was awarded a scholarship from the National Secretariat of Science, Technology and Innovation (SENACyT) to pursuit his PhD in Wageningen Agricultural University. As part of his doctoral study track he completed his third MSc in Management of Agricultural Knowledge Systems and completed his doctoral study at Communication and Innovation Studies chair group at Wageningen University & Research Centre, The Netherlands.

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