3.   DEVELOPING THEORY

The TRANSCOL project led CINARA to develop interpretative frameworks, which helped to improve interventions in WSS projects. The main frameworks developed concerned the sustainability of WSS systems, learning processes and participation in WSS projects.

3.1.   THE SUSTAINABILITY FRAMEWORK

> *Sustainability .. is not a simply intellectually abstracted concept or scientific definition: it is closely associated to wider social processes and to its historical context.*
>
> *Pugh (1996)*

Around the 1970s, the debate about development introduced the concept of sustainable development (Reid, 1995). In the 1980s, the Brundtland report defined sustainable development which was promoted by international agencies as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (CMMAD, 1988).

The debate about sustainable development has been focused on the 'green' issues such as biodiversity and global warming which are the 'sustainable' components of development, but the 'brown' agenda has been neglected (Beall *et al*, 2000). The brown agenda, "meeting the needs of the present", the 'development' component of sustainable development, implies solving problems such as water supply, sanitation, and housing conditions for the poor. The brown agenda is strongly associated with social processes and improvements in health conditions (Pugh, 1996; Mitlin and Satterthwaite, 1996). Sustainable development projects involving WSS that consider the needs of the present without neglecting the needs of the future generations are basic components of sustainable development. This is the essential meaning of sustainability in development projects.

3.1.1   Concepts about sustainability

Sustainability and sustainable development are used interchangeably although their meaning is under discussion (Mitlin and Satterthwaite, 1996). The majority of publications that discuss sustainable development ignore the needs of thousands of million people who lack

minimum housing conditions or who do not have access to food and land. Many authors consider poor people as the problem, without taking into account the factors that cause poverty and the potential that the poor have to help themselves (Mitlin and Satterthwaite, 1996).

ReVelle and ReVelle (1992) state "A sustainable society is a society that interacts with its environment in ways that leave the environment free to be used again and again". According to Williams and Haughton (1994), the principles of sustainability are intergenerational equity, social justice, and transfrontier responsibility. Williams and Haughton (1994) define urban sustainability, as "the achievement of urban development aspirations, subject to the condition that the natural and man-made stock of resources are not so depleted that the long-term future is jeopardised". They suggest that two ecological principles - minimise wastes and maximise recycling – are crucial for achieving sustainable urban development. A city is not a self-sustainable system. It is an open system with strong interactions with its environment. One of the conclusions at the United Nations Forum in Rio de Janeiro, 1992, was that development models from the North were a major cause of planetary degradation (Roelofs, 1996). New models of development have been proposed as an answer to Western models.

3.1.1.1 *Human Scale Development*

This is a model from Latin America. The model proposed by Max-Neef *et al.* (1986) considers that people are the centre of the development process. Development is for people and people are a solution rather than a problem, therefore "the realisation of needs becomes instead of a goal, the motor of development itself". Max-Neef *et al.* (1986) argue that in people-centred development, development serves people. Rather than simply increasing material standards, it improves the quality of people's lives. The model considers human needs as finite and universal but the ways in which these needs are satisfied vary from culture to culture throughout time. Human needs are more than the basic needs defined in northern models (health, education, and shelter, among others). Max-Neef *et al.* (1986) call the human needs 'fundamental needs'. These are subsistence, protection, affection, understanding, participation, leisure, creativity, identity, and freedom. Max-Neef *et al.* (1986) suggested that a need in the context of Human Scale Development was not a deprivation but instead offered the potential for creativity. Needs impel people to interact, thus generating the "satisfiers" that

people need. The access to the socially accepted "satisfiers" defines the level of poverty in a society.

The satisfiers are classified as synergistic satisfiers, destroyers, pseudo-satisfiers, inhibiting satisfiers and singular satisfiers. Except for synergistic satisfiers, satisfiers may produce "social pathologies" because they are usually imposed from above or from outside. The synergistic satisfiers can both satisfy a given need and contribute to the satisfaction of other needs. Participatory water supply and sanitation projects (WASH, 1993), which fulfil the need for subsistence as well as other needs such as participation, understanding, identity, creativity, and freedom, are one example of a synergistic satisfier.

The model implies autonomy and self-reliance. It promotes a more participatory and integrated development. Thus, participatory democracy is a fundamental component of this model. It involves development at the local level for individuals and social groups as needs are met at personal and community levels and at regional and national levels by the horizontal interdependence between regions and nations. The implementation of this theory requires fundamental changes in the attitudes of professionals and governments to encourage openness and participation and to promote enabling environments where people may develop their creativity.

3.1.1.2   *Primary Environmental Care*

Primary Environmental Care (PEC) is "an alternative to development by external assistance". According to Satterthwaite *et al.* (1996), the term is "given to the process through which local groups apply their knowledge and management capacity to address their own development needs, within systems of environmental management that are ecologically sustainable". PEC involves three basic elements: meeting the livelihood and health needs of people; sustainable management of natural resources; and empowering of local groups for self-directed development. PEC combines the brown and green agendas of sustainable development. The term was used during the Earth Summit to emphasise the knowledge and capacity of local groups to promote their own development. PEC encourages decentralisation in the decision-making process and citizen participation. Many studies suggest that resources are better managed by local groups than by external experts (Satterthwaite *et al.*, 1996). The PEC approaches have the following characteristics (Satterthwaite *et al.*, 1996):

✓ They are process oriented and flexible to adapt to changing environments,

✓ They promote a rapid return for the participant groups,

✓ They build on local knowledge with the participation of all local agents,

✓ They strengthen local organisations,

✓ They use local resources and technologies,

✓ They recognise the diversity of needs and interests within the agents, and

✓ They meet the gender-defined needs of adults and children.

Both PEC and Human Scale Development imply profound changes in government and external agencies, mainly to support local initiatives (Box 5). Changes in regulations, laws, and inside institutions are necessary in order to strengthen the co-ordination of effort between the community and local institutions. In addition, they imply movements in the project cycle towards decentralisation and the provision of enabling environments. The World Bank recognises the complexity of the development process and considers that "learning spaces" are needed to promote development (Picciotto and Weaving, 1994).

Box 5   PEC approach

What can be termed the PEC approach is for external institutions to enter into partnerships with communities for all phases of planning, management and monitoring. New research techniques and methods have been developed which respond to the need for 'ways of researching..which combine finding out about complex and dynamic situations with taking action to improve them, in such a way that the stakeholders and beneficiaries of the action research are intimately involved as participants in the whole process'

Source: Satterthwaite et al.,(1996)

3.1.2   Sustainability of development projects at the local level

Ultimately solutions to problems.. must be formulated locally, by local people, on the basis of local experience and information.

Stren, R quoted by Hardoy and Satterthwaite (1989)

In order to have sustainable human settlements it is necessary to improve the role of local governments as facilitators, and to recognise that "they can act as active agents" (UNCHS, 1996) in the development process of the poorest settlements. According to Gilbert *et al.* (1996), good governance increases the likelihood that the solution will be sustainable because good governance promotes sustainable use of resources (including waste minimisation), regulates land tenure, provides adequate infrastructure, makes appropriate investment and encourages partnerships.

Sustainability at the local level is threatened by the way that development takes place. This is often through narrowly based projects that just consider the isolated requirements of a sector. However, the community has a wider view covering all aspects of its development, not just those related to a specific sector project. Development through projects replaced development through programmes because evaluations showed the wastage of resources invested in programmes that never reached their objectives. Nevertheless, some countries, for example India, have been successful in integrating the project-based approach with national, regional, or local programmes (Abbot, 1996).

3.1.3   Searching for sustainable solutions

The sustainability concept underlines the importance of community participation, especially the participation of women, and includes ownership as one of the bases supporting it (WASH, 1993). The TRANSCOL project led CINARA to formulate a conceptual framework for 'sustainability'. In this conceptual framework, a project under the sustainability banner involves three dimensions, as shown in Figure 12 (Restrepo, 1995a). The first dimension is the community and the institutions at the local level or the group of people who identify themselves with a problem and are willing to work on their solution, in spite of their heterogeneity as a group. This human group exists in defined historical, cultural, and socio-economical contexts that shape their identity. This dimension also includes the role of the local

institutions, where their task is one of support and advising without supplanting the functions and responsibilities of the communities but, rather, strengthening, through teamwork, their possibilities and potentialities. In the public sector, governmental institutions play the most important role in technology transfer and diffusion.
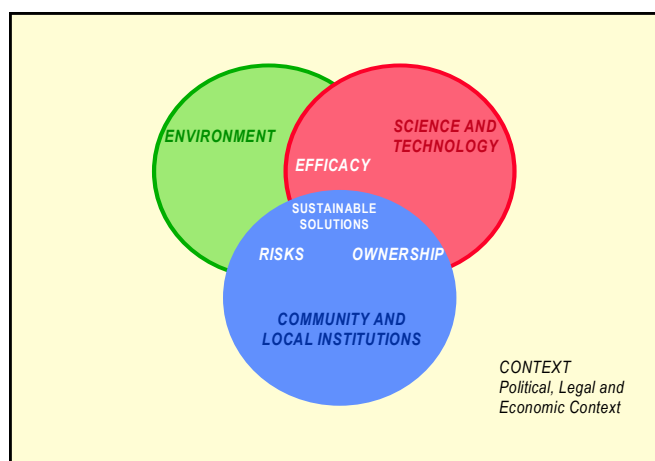

Figure 12   Sustainability of water supply and sanitation projects at the local level

Source: Restrepo (1995a)

The second dimension is the environment, in which the community lives, produces, and directs its development. The interactions between community and environment determine the real or potential risk factors to be combated. Identifying these risk factors provides a basis for recognising, typifying and prioritising actions to overcome or modify the risks. These risks can be diverse and their level depends both on the community's vulnerability and the degree of deterioration of the environment.

To eliminate or reduce the risks factors identified in community-environment interactions, the communities and local institutions look for and generate appropriate scientific and technological solutions. This involves knowledge, tools, and procedures. On these bases, the different agents of development select and perform actions. The progress of science and technology permits a reduction in the risk factors, but the solutions will last to the extent to which the community make them their own. A feeling of ownership of the solutions also will guarantee the greatest probability of sustainability.

The community-technology interactions make it possible to establish and select the options available for tackling the specific risks that emerge from the interaction with the environment or context. In these interactions, the appropriate answers to the community's demands for drinking water and sanitation needs are sought. This is done by considering, on the one hand, the expectations and interests of their potential users and, on the other hand, the technical, economic and environmental capacities existing in the different regions.

3.1.4 Factors that influence the sustainability of development projects

A vision of a sustainable project is shown in Figure 13 (Duque *et al.*, 1996). From the very beginning of the WSS project, a development level, d_0, is increased through the project to reach d_1. If the project is sustainable, the development level is maintained or increased while operating. The following factors influence the sustainability of the development projects in Latin America (Duque *et al.*, 1996):

Integral planning: Co-ordinated actions between water supply, sanitation, and hygiene education should be planned.

Community management: The community organisation and participation in the project cycle, especially in the decision-making process, are basic factors required to build capacities at the local level. The methodology should be based on respect and strengthening the cultural identity of the community. Participation of women is a very important factor.

Technology selection: Technology should be in accordance with local culture and should be affordable. Additionally, it should not jeopardise the environmental resources.

Community financing: Sustainability requires having the necessary funds to operate and maintain the infrastructure. The decentralisation process has encouraged the mobilisation of resources at the local level.
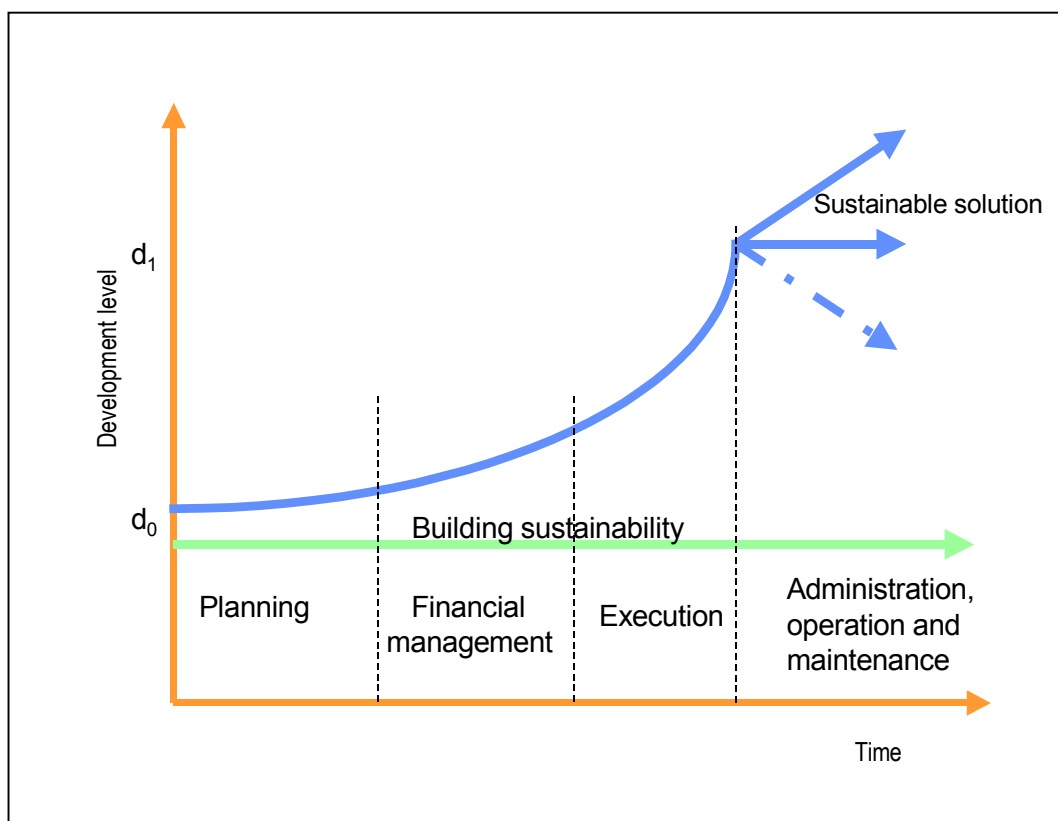
Figure 13   Sustainability of WSS projects

Source: Adapted from Duque *et al.* (1996)

Operation and maintenance: The responsibilities, as well as the resources required, should be clearly defined.

Water resources management: Sanitation projects have great influence on water resources. For this reason, careful environmental evaluations should be carried out in the planning phase.

Continued institutional support: The institutional framework should be clear. The responsibilities should be defined to support the community efforts. Clear communication procedures are needed.

3.2. LEARNING PROCESSES

> *By drawing out the things the learner already knows, and showing their relevance to the new thing which has to be learnt, the teacher has done three things. He has built up the self-confidence of the man who wants to learn, by showing him that he is capable of contributing. He has demonstrated the relevance of experience and observation as a method of learning when combined with thought and analysis. And he has shown what I might call the "mutuality" of learning—that is, that by sharing our knowledge we extend the totality of our understanding and our control over our lives.*

> *Nyerere, J. (1978)*

The International Ministerial Conference on Water Supply and Sanitation in The Netherlands (1994) (IRC, 1995) recognised that there is a need for developing capacities in the WSS sector. Capacity building is necessary at each level, but especially at the local level. This is because, as a result of the decentralisation process, local governments are now responsible for delivering services. In learning environments, people may discover answers by themselves to the problems that they have. However, one of the problems of learning is that traditional concepts of training do not fit in well with the new ideas about learning environments. Traditional concepts are teacher-centred, while the new concepts emphasise active learning (Garven, 1991, Bransford *et al.*, 2000). "The traditional model is based on the idea of teaching as telling", whereas the new models are based on problem-solving approaches. Consequently, learning projects have to reconsider the adult learning cycle in order to apply methodologies that really improve the human capacities. Figure 14 compares traditional training and the normal adult learning cycle (Little and Van de Geer, 1994).

CINARA (1995) developed a conceptual framework for capacity-building based on Human Scale Development where training was people-centred and the realities of the adult learning cycle were specifically taken into account. Figure 15 shows the conceptual framework proposed by CINARA. These concepts regarding capacity building considered that failure was an important part of learning and development was a complex process with uncertainties in which teaching and learning were a two-way street. This research considered that these concepts about development, sustainability, and learning environments could be applied to WSS projects to contribute towards improving the sustainability of the technological solutions. Freire's point of view (Freire, 1970) affirms that the learners "should not be considered empty vessels which need to be filled up with information". This modifies dramatically the concept of the external agent as an expert and the recipient community as ignorant. In the learning

project approach, the external agent is a facilitator who can share his/her experience and can recognise other kinds of knowledge coming from local communities (Bransford *et al.*, 2000). Thus, communities and institutions are encouraged to use their creativity in solving the problems.
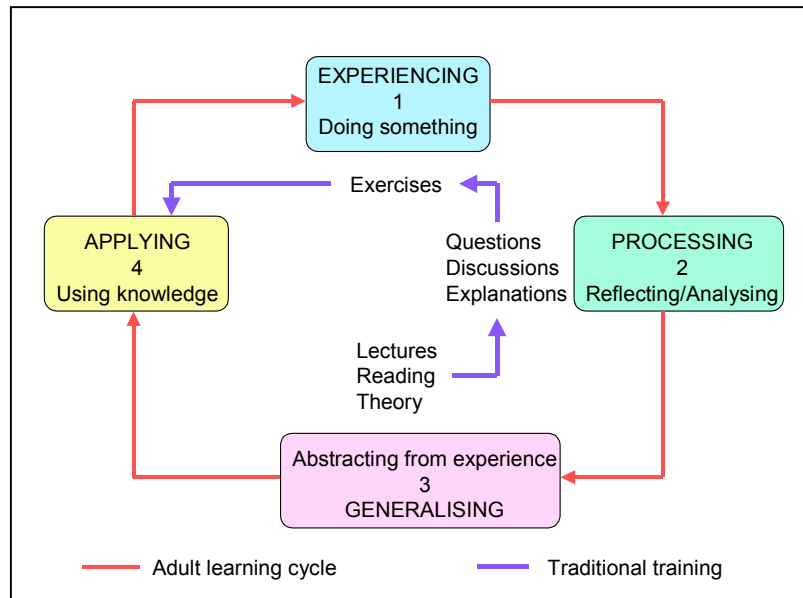

Figure 14   Adult learning cycle vs traditional training

Source: Little and Van de Geer (1994:2)

3.3.   PARTICIPATION

3.3.1   General framework

> *The reality is that it is simply impossible to define any aspect of communal life from which the government is totally absent.*
>
> *Abbott (1996)*

Community and local institution participation is strongly associated with the sustainability of development projects. Abbott (1996) suggests that there are four types of community participation in development projects: community development; political empowerment; community management; and negotiated development. These approaches of

community participation are based on different development models promoted by international agencies. Additionally, the approach is more likely to be a success if it takes into account the context, which could be exclusion, confrontation, inclusion, or consensus according to the degree of openness of the government and the complexity of the decision-making processes.
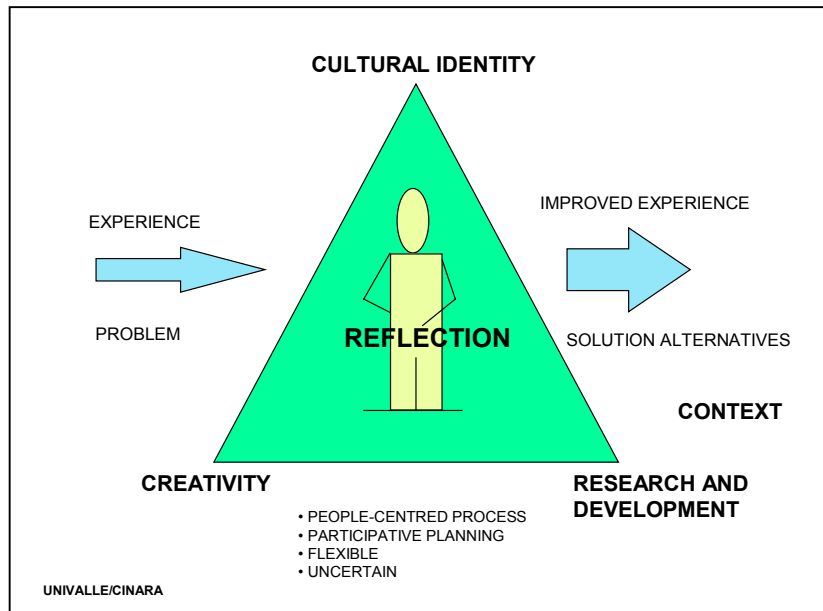

Figure 15   CINARA's conceptual framework for capacity building

Source: CINARA (1995)

Figure 16 shows the conceptual framework proposed by Abbot (1996) for community participation approaches. Given that in Latin America the openness of governments is increasing, it is expected a context of consensus for implementing successful development projects or, at least, a context of inclusion that allows community participation will be created. However, given that the projects have an end point, the question remains as to whether community participation through development projects promotes sustainability of the services. According to Abbott (1996), the traditional argument is that the operation and maintenance of the infrastructure is a continuation of the project. Nevertheless, multiple experiences have shown that organisations collapse when the objectives of the project have been reached (Abbott, 1996), especially where participation takes the form of consultative or physical work (Box 6). The evaluation of many development projects have shown that in the case of

community development and community management, five characteristics are necessary (Abbot, 1996):
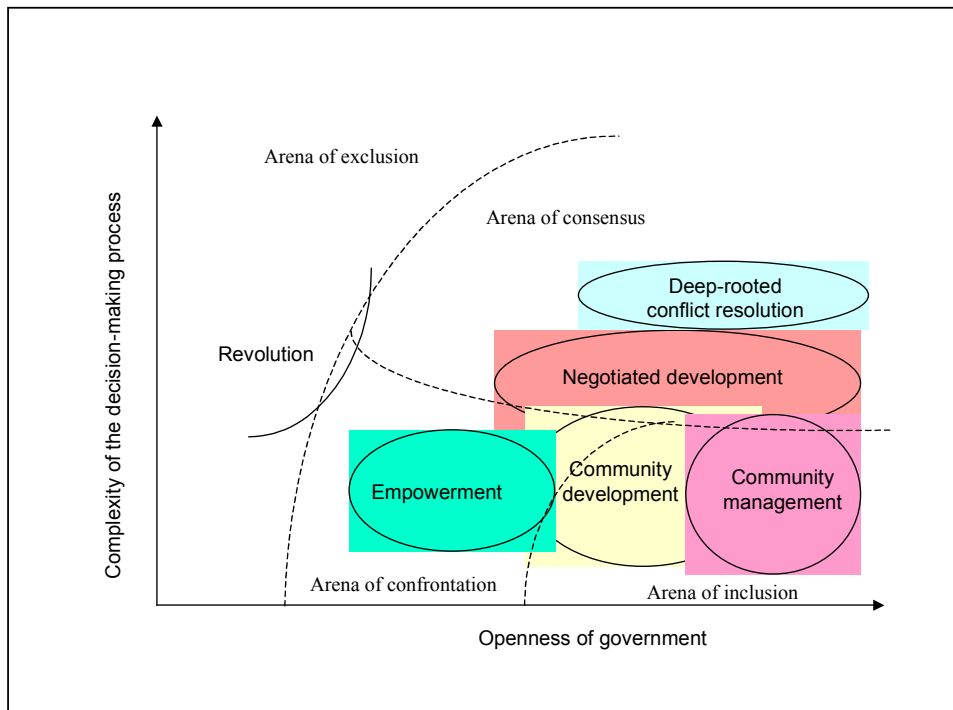

Figure 16   Community participation in development projects

Source: Abbott (1996:126)

a) The government has to be open to community involvement,

b) Activities should be built around social issues,

c) The project should be local,

d) The objective should be to satisfy the community needs, and

e) Training should not be focused on political issues.

Several basic factors help to facilitate community participation in development projects in urban areas. These include: interactive relationships between government and community; a government open to the idea of active community involvement; inclusion of economic and technical components in the project; participation of several stakeholders from both the government and the community; and the community needs and all the project variables be recognised such that a fully integrated project can be developed (Abbot, 1996).

Box 6   Conventional community participation

In conventional rural and urban development projects, there is little participation in the sense of those who are within the project area or affected by it having the right to influence priorities, project design and implementation. In fact, 'participation' may be no more than external agencies informing the recipients about what is going to happen. Or it may simply be encouraging local people to sell their labour in return for food, cash, or materials, during project implementation. Yet these incentives distort perceptions, create dependencies, and give the misleading impression that local people support the project. Such paternalism undermines the possibility of sustaining the beneficial impacts of the project after it has been completed. As little effort is made to build local skills, interests and capacity, local people have no stake in maintaining structures or practices when the flow of incentives stops.

Source: Satterthwaite et al. (1996:194)

Usually community participation is seen as a confrontation between community and government, but Abbott (1996) identifies the following stakeholders in development projects in a context of consensus (See Figure 16): politicians and officials from government agencies; opposition groups; community organisations and interest groups; NGOs; technical professionals; funding and financial agencies; and the private sector. These stakeholders have different needs and interests that must be taken into account during the course of the project. Individual empowerment is the starting point for community action (UNDP, 1997). Alliances, partnerships, and compromises are the only viable vehicles for peaceful and sustained processes (UNDP, 1997). Several months, or even years, are required to build up the necessary mutual trust and respect. The government may be perceived as corrupt or bureaucratic, the private sector as greedy and uncaring, local communities as too parochial and divided, and academic experts as out of touch with reality (Buckeley, 1996). Bringing such

groups together requires a great effort and good leadership. The extent to which the community takes part in the decision-making process is a good measure of how successfully community participation has been implemented. Many projects that have been reported as successful have failed when the external agent leaves. This suggests either that the community has not been involved in the decision-making processes through the project cycle or that the decisions made were not a product of a consensus between the stakeholders.

3.3.2   Different paradigms

CINARA has been applying some concepts to WSS projects that take into account that fact that the problems in the WSS sector are very complex and include not only technical elements, but also social, economic, environmental and other aspects. Therefore, the projects require community participation, inter-disciplinary approaches, and inter-institutional collaboration (Duque *et al.*, 1997).

a.   Adopting a people-centred paradigm

In this concept, the centre of interest focuses on the people, rather than the technology. Communities are viewed not as beneficiaries, but as stakeholders in the search of their own development (Korten and Klauss, 1984; Cernea, 1991; Max-Neef *et al.,* 1986; Chambers, 1993). This implies the recognition of the cultural diversity that exists in Latin America, as well as respect for diverse points of view. Processes based on this concept take into account conflict management, joint construction of knowledge, and the development of the critical and creative attitude of the participants in the process. Thus, a project becomes what Engel (1995) calls a "theatre of innovation" in which the stakeholders learn, receive training and are able to put in practice their ideas in order to reach sustainable solutions. Applying this concept to WSS projects means that the project becomes a space where the authorities, the institutions, and the community collaborate with each other. The institution staff transform themselves into facilitators, promoting enable environments for real community participation (Box 7).

Box 7   **People-centred approach in WSS projects**

A people-centred paradigm applied in WSS projects leads to:

  ✓ *Promoting work strategies that allow the participation of all stakeholders involved in the problems,*

  ✓ *Working with communities according to their context, recognising their knowledge,*

  ✓ *Having as final objectives community self-management and autonomous relationships between communities and institutions,*

  ✓ *Bearing in mind the different areas of responsibility, work and authority as well as different accesses to resources by women and men,*

  ✓ *Including the costs that represent community and institution participation,*

  ✓ *Promoting the participation of women and men, children and adults and any other group in every phase of the project cycle, in the decision-making processes, and*

  ✓ *Conceiving the participation as a systemic process rather than a punctual activity.*

b. Matching the disciplines

As in any other development projects, WSS problems can not be solved from the perspective of a single discipline (Max-Neef, 1987). WSS projects should break the barriers and create a space where the different disciplines can meet and review the problems and solutions. The experience in Colombia has shown that many professionals and community members working in this way have gained self-confidence from participating in participatory projects such that they feel able to develop further projects (Visscher, 1997). As Virginia Chumacero, one of the participants in the participatory evaluation of WSS projects in Bolivia (MinVivienda *et al.*, 1997), stated: "This approach is much better than what normally happens with engineers saying don't interfere with my stand posts, just stick to your questionnaires. Here, we have worked together and shared the information which gave us a much better base to understand the problems" (quoted by Galvis *et al.*, 1996).

c. Systemic analysis

Analysing WSS problems as a system lead to the consideration of several aspects of the existing conditions and characteristics of the community. Thus, in a WSS project, economy, environment, and culture are related to the technical issues. On the other hand, WSS systems have operational components (which are part of the *software*) that are different

from the physical components (*hardware*). A water supply system begins in a basin, and ends with household devices. A sanitation system begins in the household and ends in the receptor basin. In addition, the administrative system and the users are very important parts of WSS services. In this analysis, it is necessary to include the extent of the community's space, which forms part of the settlement, along with the educational and health centres. As Figure 17 shows, the household is at the centre of WSS systems (Kolsky, 1997) and is the reason for their existence. However, in Colombia, for example, according to the Drinking-Water Act, households are not considered to form part of WSS systems. Additionally, in rural areas and small towns, WSS systems have very strong relationships with production systems. In conclusion, WSS projects in general are related to other sectors such as education, health, environment, and agriculture, among others.
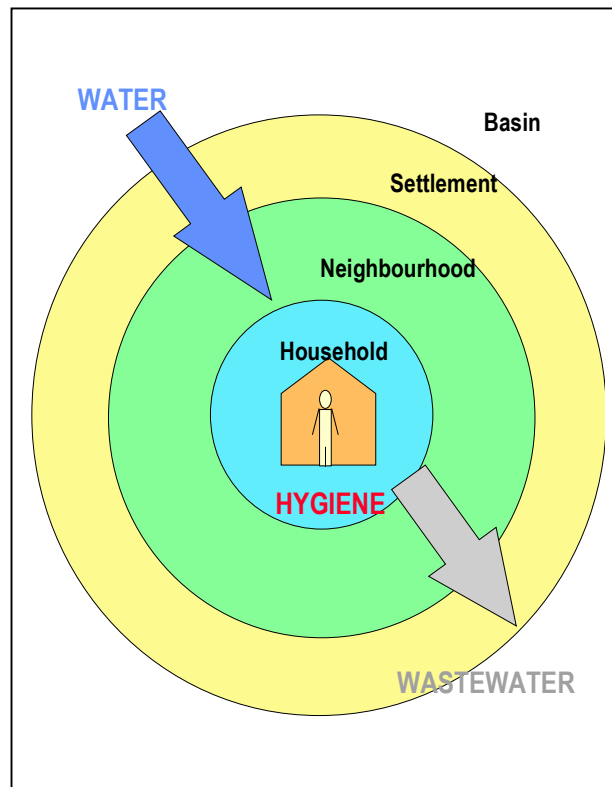

Figure 17   Integrated WSS services

Considering that in Latin America, development funds are distributed through governmental channels, it is crucial to find strategies where institutions can learn how to

implement participatory approaches (Thompson, 1995). The decentralisation processes that have been implemented in Latin America allow the application of those approaches, thus improving the quality in the decision-making process, efficiency, and enterprise management (Okun and Lauria, 1991).