# *Multi-stakeholder learning in Colombia*

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## Abstract

This paper discusses the experience of the Technology Transfer Programme on Water Supply Treatment (TRANSCOL) that was implemented between 1989 and 1996. The Research and Development Institute on Water Supply and Sanitation, CINARA of the University of Valle in Cali, Colombia, with its advisors and in close collaboration with the IRC International Water Supply and Sanitation Centre, was the facilitator of the process. The programme was oriented to scaling-up community water supply treatment by Multi Stage Filtration in Colombia. In essence it was a multi-stakeholder learning programme with many of the characteristics of a learning alliance.

This paper describes the programme, its strategy and results, looking at the programme period and subsequent experiences of CINARA and IRC. It includes a review of the long-term results based on recent interviews with people ten years after their involvement in the programme. In view of the mixed results, important lessons can be drawn about the approach, the need for structured facilitation and the need to change university education.

## Introduction

The TRANSCOL programme was initiated in 1989 to introduce water treatment by multi stage filtration (MSF) in 8 regions in Colombia. It received financial support from the Netherlands government and different Colombian organizations who already at that time agreed on the importance of water quality improvement. This was quite forward looking as even today water quality is still an underrated issue in community water supply. The Millennium Development Goals (MDGs), the worlds' targets for dramatically reducing extreme poverty in its many dimensions by 2015 – income poverty, hunger, disease, exclusion, lack of infrastructure and shelter – while promoting gender equality, education, health, and environmental sustainability, talk about providing safe water supply to the un-served population of 1.1 billion people (UNDP 2005) based on the statistics of the joint monitoring programme.

However this programme uses a different terminology with 'unserved' meaning people not having access to some form of improved water supply. The difference in terminology is important. For example, all people having access to piped water supply are considered to have access to improved water supply, but many of these supplies do not involve adequate water treatment and many provide intermittent water supply and therefore cannot be considered 'safe' in terms of water quality (Lloyd and Helmer, 1991; Visscher et all 1996b and 1996c; Quiroga et all 1997). So in fact the un-served population in terms of ***safe*** water supply is considerably larger.

In Colombia, it is estimated that 80 percent of the water supply systems depend on surface water (Foster et al. 1987). Often this water is subject to bacteriological and sometimes chemical contamination and needs to be treated to avoid the risk of disease transmission. This can be done by the users, for example, by boiling the water before use, or by including water treatment as a component in water supply systems. A survey in 1997 in 641 municipalities (out of the total of 1068) showed that some 16 percent of the small urban centres below 10,000 were considered to have adequate treatment. In rural areas the situation is even more critical as indicated by a survey in 2002 that showed that only 7 percent of the water supplies received some form of treatment (El Tiempo, 04-11-2004), only part of which can be considered effective.

## Rural water supply treatment is complex

Rural water supply treatment in developing countries is very complex as it has to function in a very constrained environment. The treatment process therefore has to be robust, reliable and relatively simple to operate and maintain. Multi-Stage Filtration (Box1), a water treatment system developed by Cinara and IRC in Colombia on the basis of earlier experience with slow sand filtration was felt to meet these criteria and therefore a programme was established to introduce this technology on a broader scale in Colombia. However just looking at the technology is not sufficient. Other aspects such as user interference need to be looked at. This may include users undertaking activities in the catchment area that influence the treatment or users leaving their taps open all day, thus affecting the water distribution leaving others without water. This might lead other users to exert pressure on the operator to supply more water which in turn has led operators to by-pass the treatment system.

## Introducing MSF in Colombia

When MSF did show very good results in projects close to Cali which generated considerable interest in several municipalities, the question became how to transfer the technology to other communities and how to scale-up the approach so as to make it part of the regular operations of drinking water supply development agencies.

**Box 1. Multi-Stage Filtration (MSF)**

Multi Stage Filtration is a combination of coarse gravel pre-filtration and slow sand filtration (SSF). In the pre-filtration system water passes through layers of gravel and in the SSF through a layer of sand. The treatment involves a combination of biological, physical and chemical processes, with the biological process being strongest in the 'Schmutzdecke', the 'dirt layer' or bio-film that is formed on top of the sand bed in the SSF by straining material from the water. The combination of these processes allows treatment of more contaminated water sources than by SSF alone. MSF is a robust and reliable treatment method that can be maintained by operators with low levels of formal education. It is much better suited to the conditions in rural communities and small and medium size municipalities in the South as well as in more remote areas in the North, than chemical water treatment (Galvis et al., 1998).

The management of an MSF, because of its biological nature requires good care particularly controlling the filtration rate and the different cleaning processes involved. This in turn requires that the operator understands the treatment process to manage this 'water-ecosystem'. The 'treatment concept' includes protection of the water source and catchment area to ensure that water of the best possible quality reaches the MSF. The role of the users is important in three respects. They may i) contribute to protection of the catchment area where they may have cattle, cut trees or work their fields, they may ii) support the adequate performance of the system by adopting an efficient water use thus putting less pressure on the flow rate in the system and they may iii) occasionally assist the operator in more laborious operations such as re-sanding or washing the gravel.

According to Rogers (1995 p. 140) "technology transfer is the exchange of technical information between the Research and Development (R&D) workers who create a technological innovation and the users of the new idea". He suggests that in the conventional conception it is seen as "a one-way process, usually from university-based researchers to individuals in private companies who develop and commercialize the technological innovation. In this traditional and limited view, the technology is seen as hardware, a physical product" (ibid) Rogers adopts a broader view by suggesting, based on Eveland (1986 in Rogers, 1995) that "technology usually consists of software as well as hardware, and thus that it is essentially composed of information, making technology transfer a communication process, a two-way exchange (…). Even when a technology moves in one direction, such as from a university to a private company, the two or more parties must participate in a series of communication exchanges as they seek to establish mutual understanding about the meaning of the technology" (ibid).

However, even this wider definition of technology transfer still focuses on the transfer of a technical solution. It does not include the learning environment to solve the problems felt by the users, nor does it look at the critical role of the environment in which the technology has to be embedded. Even in its narrow definition, technology differs from scientific laws that have a universal character, in that it encompasses the historical fingerprint of the society that produced it. Technologies are usually developed to solve a specific problem; transferring it to a different context often leads to failure or

deficient performance (Reddy, 1977 cited in Garcia, 1996), unless it is reinvented (adjusted to the new environment). Once the technology is adopted on a larger scale it can be argued that the technology in turn leaves its footprint on the society that uses it.

### Opting for a people oriented learning approach

The CINARA/IRC team realised that various factors in the Colombian context implied that the technology transfer paradigm (Rogers, 1995) would not be adequate to ensure widespread use of MSF in rural communities or its incorporation in the approaches of agencies. These factors included the strong bias of engineers towards conventional chemical water treatment, the very limited experience of communities with water supply treatment, and the limited institutional support for rural water supply leaving the sustainability of systems mostly in the hands of communities.

The team therefore decided to develop the TRANSCOL programme that was more people oriented and embraced a learning approach. This programme worked with sector institutions and communities in a joint learning environment, characterised by mutual respect. It intended to accommodate the different levels of experience of communities and the diversity of agencies. It became a multi-stakeholder learning programme that has many characteristics of a Learning Alliance. Its approach is very much in line with the view of Röling and Jiggins (1998 p. 285) that humans acting effectively in the environment, depend on their ability to collectively learn, construct and share useful knowledge and technology. An effective water supply system is the emergent property of the interaction among multiple stakeholders.

## The programme

The TRANSCOL programme was considered necessary because regional organizations involved in the water sector in Colombia became interested in water quality improvement and started to build systems often using inadequate designs leading to poor performance and huge operation and maintenance problems. Thus a clear need existed to disseminate the new experiences with MSF and establish advisory capacity in the regions. This was even more important because the Colombian government moved along with the international orientation by shifting the responsibility for water sector planning from the Ministry of Health to the Ministry of Development and by initiating a process of decentralization in which municipalities became responsible for their own water supply service.

TRANSCOL had two main objectives:

- To introduce water treatment by MSF in 8 regions in Colombia through the development of 16 demonstration plants, two in each region;
- To establish working groups in these regions which could serve as future advisors on the implementation of MSF technology in their region.

Initially the programme was developed by staff with an engineering background but already in an early stage social scientists became involved and a real multi-disciplinary team effort emerged. A systematic programme strategy was developed that comprised of a series of logical stages (Box 2).

### The programme philosophy made the difference

The strategy shown in Box 2 gives the logical sequence of events that was followed, but is not the heart of the project. What really made the difference was the philosophy behind the programme and the approach followed within the different stages. The programme staff adopted a new approach which they called that the 'joint learning project approach' which is characterised by the following key elements:

- ***A development paradigm centred in people***

The centre of interest was transferred from the technology to the people. It starts from the premise that the actors, both in the institutions and in the communities, posses knowledge and experience that can be built upon. Communities are not seen as beneficiaries, but as actors in search of their own development who will be taking decisions throughout the development process. Adopting the view of Paulo Freire (1972) that ‘students should not be considered empty vessels which need to be filled up

with information', dramatically modifies the concept of the external agent who knows all, while the recipient community knows nothing.

**Box 2: The main stages in the TRANSCOL programme**

- **Selection of the region**, taking into account its potential for the application of MSF and the existence of institutional interest to participate in the process.
- **Introductory seminar in the region;** After meeting with political and institutional leaders involved in the sector, a regional seminar was held to present the programme, its objectives, philosophy, strategies and organization. Also the relation of the programme activities with sector policies was presented and the important role that R&D can play.
- **Establishment of Inter-institutional Regional Working Groups (IRWGs);** The regional seminar resulted in the establishment of an IRWG in each region, formed by staff from all key sector institutions, and in agreements about the support by these institutions.
- **Selection of project sites** was carried out by a multi-disciplinary team of members of the IRWG, guided by two staff members of CINARA, an engineer and a social scientist. Selection started with a review of information available in the institutions followed by a one-day visit to each of ten pre-selected communities to discuss their interest and to verify and complement the information obtained. Subsequently the IRWG selected two communities with highest potential and two possible alternatives. Selection was primarily based on: good accessibility, existence of a problem that could be solved by MSF treatment, willingness of community to participate, presence of a sector institution to support the project and the feasibility to implement within a reasonable time;
- **Development of a project design for each community** which was initiated with a three-day field visit to the two selected communities to collect additional information and establish initial agreements with them. Thereafter a two-week training was arranged in Cali to learn about MSF and the learning approach promoted in the programme and visit existing MSF systems in Valle del Cauca. Participants returned to their region with an outline design of the MSF system and an initial socio-educative plan for working with the community in the different project phases.
- **Starting-up the activities in the community** began with a creative workshop in which community members, both men and women, reflected on the potential health benefits of water quality improvement, and reviewed and approved the plans for the water treatment plant and for the socio-educative activities. They also discussed the costs and their possible implications for the water tariff needed to sustain the system.
- **Financing, tendering and construction** started with the verification of available financial resources in the communities and agencies, and the levels of credit required. Tender documents were made by the IRWGs and tender procedures implemented mostly through the municipalities who subsequently made a contract with a contractor. Construction was organized in consultation with the community and included their participation in an official civilian monitoring committee. Training of water committees and operators (who had no experience with water treatment) started during construction.
- **Starting up the plant** began by accompanying the operator and the water committee in the process of initiating plant operation, filling the units with water, putting them into operation and gradually increasing the flow velocity when maturation of the biological layers proceeded. In this phase, efforts were also made to stimulate the community to improve the protection of the catchment area and enhance efficient water use.
- **Monitoring and evaluation** comprised several visits from the IRWG and CINARA staff to support the water committee and the operator to monitor the performance of the system and to analyse possible problems with its functioning and use. As part of the overall evaluation of the Programme, a national workshop was organised in which staff from IRC, CINARA and the IRWGs, as well as community members, participated.
- **Dissemination of results** was done through meetings and more continuously through advisory services, follow-up activities in the projects and development of new projects.

- ***Dialogue and participatory techniques***

By using particpatory approaches projects become a space where the authorities, the institutions and the community share their experience. This space enables the community to draw on their experience and to review the history of their water supply system. Participatory techniques such as mapping help to visualise and clarify the situation and provide a basis for project development. This helps to stimulate dialogue which differs from the more common discussion, which has its roots with 'percussion' and 'concussion', literally a heaving of ideas back and forth in a winner-takes all competition (Senge, 1990).

- ***Adopting a systemic orientation***
  'Hard' system thinking has been at the heart of the WSS sector for a long time, seeing technology as the main solution to a straightforward problem of people not having adequate water supply. According to Checkland (1989), hard system thinking assumes 'a relatively well structured problem in which there is virtual agreement on what constitutes the problem: it remains to organize how to deal with it'. This way of thinking has been persistent in the sector because of the dominance of engineers, who in their educational background are very well equipped to think systematically and to focus on problem solving, and the virtual absence of users in decision making. However, the poor performance of many water supply systems shows that the problems are much more complex and require a systemic way of thinking, questioning the problem in its overall context and leaving room for different interpretations. In practice, a multiplicity of views on both the problem and its potential solutions will emerge, suggesting that absolute truth does not exist (Engel, 1995). We deal with different interpretations of reality that are products of the experience, knowledge and views of participants.

- ***Establish an interdiciplinary and interinstitutional learning environment***
  Development problems are of such magnitude that they cannot be resolved from the perspective of a single discipline or a single institution (Max-Neef, 1987). It is therefore needed to break the barriers and create a space where the different disciplines and the community can meet, review developments and contribute their experience. This permits all actors to jointly explore the causes of problems, identify solutions and establish commitment about their implementation.

- ***Process facilitation***
  In view of the complexity of the problems and the differences in the background of the actors, the facilitator plays a crucial role. If we take the view of Freire (1972), it is necessary to challenge the participants (members from the community and the institutions) to use their creativity to identify problems and possible solutions and take decisions accordingly. This requires that a learning environment is created in which participants can question and confront their view points and perceptions. This needs good facilitation helping the participants to gain self-esteem and autonomy and empower them to challenge the existing situation and model it to suit their own objectives.

  It is important for the facilitator to stimulate a collective learning process that starts with dialogue, or an open exchange of ideas in the group. This permits the participants to discover their potential and perspectives, which is difficult for them to do alone. Team learning develops the skills of groups of people to look beyond individual perspectives. This is not easy, particularly not in a politicized environment such as the water and sanitation sector in Colombia. For staff from sector organizations to assume the role of facilitator implies a considerable change from their normal work. They may feel vulnerable and will need training and most of all a new attitude to be able to act as effective process facilitators. It is not enough to learn new methodologies, new 'tricks'. It is more important to adopt a learning attitude, and learn how to establish an environment of respect for conflicting views, even to the extent that they go against his or her personal opinion. A facilitator thus needs to be a mediator of the discussion and stimulate the participants to express their views and ideas.

Throughout the programme an approach was followed that combined structured learning events both in CINARA in Cali, and in the regions, with learning by doing in the field in partnership with the community. This approach created an environment in which the partners could gain confidence and develop ideas and activities and obtain feedback from the trainers, and perhaps more important, from their colleagues, their peers. The learning projects created the 'safe' space to experiment with the technology in close collaboration with the institutions and the communities, thus allowing checking the technology against real world problems (Quiroga et al., 1997).

TRANSCOL did not yet adopt the gender approach that is now being promoted in the sector (see Van Wijk, 2001), but it did make special efforts to stimulate involvement of women through house visits and by organizing meetings at times and places that did not interfere with their daily work. Creative workshops also proved an excellent mechanism for this and for team building. Other forms of

communication such as painting, music, theatre, modelling and poetry were used in these workshops to bring the participants closer together and stimulate sharing of experience. This also helped the less vocal participants (the unheard voices of often poor men and women) to gain self-confidence and 'voice' opinions, sentiments, preferences, objections and ideas in public.

## The actors and the programme network

The programme involved a large number of actors operating in what can be viewed as different interacting and nested platforms for decision making. In his discussion of resource use negotiation, Röling (1994) defines a platform for decision-making as a nodal point of social interaction among stakeholders to allow for integral decision-making about a resource they perceive to be in need of management. He argues that stakeholders coming together in a platform to manage an ecosystem must learn from scratch about the system, agree on its boundaries, share concepts about its sustainable management, develop indicators for success and methods for making things visible (Röling, 1994). Visscher (2005) argues that in the water sector such platforms must be able to operate with three logics: (a) the logic of the ecosystem, both in terms of catchment management and the management of the biological process in the SSF; (b) the logic of the social process by which human activities translate into cubic meters of purified water; and (c) the purely technical management of water involving aspects such as flows through pipes, filtration rates, etc.

CINARA with its advisors and in close collaboration with IRC can be considered the ***first platform*** having decision-making authority over the part of the programme that was financed by the Netherlands government. They worked in collaboration with national institutions that co-financed the learning projects. Multi-disciplinary teams of engineers and social scientists were established in CINARA. These teams developed and tested the approaches and strategies together with IRC staff.

The IRWGs formed the ***second platform*** made up of staff of different institutions involved in the water supply sector in the region. Decisions at this level often needed the approval of political or institutional levels in the region, which were not directly involved in the IRWG. This was one of the reasons for initiating the programme in each region with a meeting with the governor and his staff to inform him and get his support. Technical staff and unfortunately considerably fewer social scientists, being a minority group in the institutions, became involved in these IRWGs, be it on a voluntary and part-time basis with approval of their bosses. The participatory process in the programme helped to develop their capacity to critically analyse the situation and stimulated their creativity and responsibility to take action. The learning continued in the field, where staff from the IRWGs was accompanied by CINARA staff members and where community members were included in the process.

The ***third level platforms*** were formed at the community level in each of the 16 participating communities. First, contacts were always established with the local formal and informal leaders. This was followed by a community meeting to inform as many community members as possible about the programme. Dialogue and interaction between agency staff and communities was stimulated through participatory tools and techniques that helped people to gain insight in their own situation. Horizontal working relations were aimed at, respecting different opinions and stressing that everybody has contributions to make. The approach recognized the cultural identity of each community and supported the reconstruction of the history of their water supply. The main activities at community level included: house visits, observations, focal group meetings, structured and semi-structured interviews, creative workshops and the formation of support groups. These groups assisted the community organization responsible for the system to shape the project and monitor the implementation of concerted activities.

## Impact and lessons learned

Important lessons can be learned from the programme, both based on the immediate impact as reflected in the participatory review workshop held in March 1996 and a recent review that included consultations with CINARA staff members, members of the IRWGs in four regions and community members in five communities.

- **Scaling-up of the MSF technology and TRANSCOL methodology;**
  The TRANSCOL project has led to a replication ('scaling out') of the technology in Colombia. To date, for example, more than 25 MSF systems have been established in two of the programme regions and several new systems have been put in operation in the three other project regions that were visited in 2005 as well as in other regions. Initially this spread of the technology was strongly stimulated by the staff from the Regional Health Services (RHS), which was leading the sector in most regions and well represented in the IRWG. Unfortunately one year after the end of the programme their mandate changed, in the context of the decentralization process, from implementing agency to the organization responsible for water quality surveillance. This significantly hampered the effectiveness of scaling up of TRANSCOL achievements and lessons, although some of the staff of the RHS shifted to the private sector and continued to design water treatment systems.

  Impact was also achieved at the national level, as the Ministry of Development financed a follow-up project on sustainable water supply with CINARA and came to accept that technology was not the only problem but that capacity building was also needed. They established a new training programme which they called 'cultura empresarial' (management culture) that included part of the material developed by CINARA. The implementation however, was only through short courses and did not follow a process approach with emphasis on dialogue. Hence further steps are needed to truly make the shift to viewing the problems and solutions in a systemic way.

- **Initial interest in the IRWGs stabilized at lower level**
  The IRWGs proved to be an effective mechanism to create commitment among staff of relevant agencies to MSF, the community involvement strategy and the inter-disciplinary and inter-institutional approach, thus creating an environment for scaling-up. A difficulty however, proved to be to keep the group together. After an initial period of enthusiasm, attendance in the meetings started to dwindle. The voluntary nature of the participation led to pressure on some staff in their own organizations to give priority to their normal routine work. This was possible because the management of some of the organizations did not attach sufficient value to the learning projects. This seems to confirm the way in which, according to Röling and Jiggins (1998 p 292), social science understands policy makers and scientists. This view stresses that most policy makers and scientists, usually influenced by economics, tend to ignore learning processes and their facilitation. They view, in this case water supply, as a technical problem.

  Other members were allowed to continue their work in the IRWGs and did this with enthusiasm making the learning projects a success, yet perhaps leaning too much on the core team of CINARA and not taking full benefit of the learning. The end of the project in fact also meant the end of the IRWGs showing that a key driver (in this case CINARA) and financial resources are needed to sustain the effort.

- **MSF systems are community managed**
  To date almost all MSF plants built under TRANSCOL are managed by water committees. In fact, the programme has very much stimulated this form of community management because it helped the community members to learn about the technology and to deal with related issues such as tariff setting. Most importantly, it helped them to gain self-confidence as their contributions were equally valued as those from the agency staff.

- **Most MSF systems from TRANSCOL still operate**
  Most of the 16 systems are still functioning and are in reasonable shape. Yet as was confirmed in the visit in 2005 it may be expected that all are in need of some repairs, including replacement of valves and filter sand, and all face operational difficulties in terms of short filter runs because of inappropriate maintenance procedures. In several of the visited systems, the applied filtration rate is too high because of inefficient water use, multiple water use and leakages in the (very old) distribution systems. The good thing is that efforts are being taken by different municipalities to renew these systems, even though this is rather costly. The multiple water use for domestic purposes as well as for watering cattle, small scale irrigation and washing coffee beans seems an important reason for people to be more concerned with water quantity than quality. Unfortunately the programme did not sufficiently address this issue as the focus was more on the MSF technology and it was assumed that people would change their behaviour when the water quality improved. Yet the recent review shows that this seems not to happen and most MSFs are still operating at too high filtration rates. In one case it has even led to mixing the water from the plant with untreated water from another source.

- **Operators make an effort but establish wrong practices**
  Without adequate supervision and back-up support operators have adjusted their operation and maintenance procedures in an undesirable direction making them actually more difficult, clearly showing that they do not sufficiently appreciate the biological nature of the treatment process. Other operators have not had formal training but learned their job by getting oral instructions from operators they replaced, which without proper supervision leaves a lot of room for misinterpretation as reflected by the way they implement some maintenance procedures.

- **Learning projects a good approach to capacity building and innovation**
  Learning projects proved to be a useful vehicle for capacity building of agency and university staff and community members. Some of the operators and the agency staff involved in the programme still hold their job and not only remember TRANSCOL and the very positive attitude of the CINARA staff very well, but also apply some of the things they learned. Unfortunately the 2005 review showed that the learning period was too short. The learning project approach has been developed and further consolidated into Joint Team Learning Project (JLPs) and has been applied by the CINARA team in other projects and the participatory methods that were developed in the programme have been the basis for participatory evaluations by the CINARA team often in collaboration with IRC in different countries in the region.

  All CINARA staff members that were interviewed in 2005 indicated that TRANSCOL really helped them to learn to work in an interdisciplinary way and to work with communities. They also said that because of their involvement with CINARA they were able to use this in subsequent projects, yet with the restriction that the time for learning in these projects was much more limited than in TRANSCOL. In the most recent project, the situation is even more difficult as the implementing agencies seem again to be putting much more pressure on quantitative targets in terms of constructed facilities than on the broader activities with the communities that are essential for the adequate functioning and the sustainability of water supply systems.

- **CINARA grew as a team and in recognition**
  TRANSCOL and the parallel research project on pre-treatment technologies provided the opportunity and the resources for CINARA to grow as a team, experiment with the technology and the methodology, build up its information and documentation centre and establish a strong national and international network. This made an important contribution to the development of CINARA as a sector resource centre, with national and international recognition, working in Colombia and other countries in the region.

- **Universities adopt MSF technology but not the methodology**
  In four out of the five programme regions that were visited in 2005, MSF has become part of the curriculum of universities in the region. Hence this is an important transfer channel as young engineers learn about the technology and often field visits are included in the training. The

teachers all were involved in TRANSCOL and some of them have carried out research activities on MSF in their university. This is a positive development, clearly showing the potential of the university as a transfer mechanism, provided they concern themselves with development programmes.

Whereas all teachers agree that the social science component is crucial, unfortunately they do say that they cannot include this component in the university programme because of time limitations. At best a voluntary training course can be taken in some universities that deal with these issues. This, however, appears not to be so different in Europe-based universities and training institutions including those that receive students from developing countries. This implies that unless this is changed we need many more TRANSCOLs. The fact that the university teachers can take this position is unfortunate, because the importance of the socio-economic component can be demonstrated in a relatively short period of time so as to at least stimulate the interest of the students. The problem has deeper roots; the management of the universities has not really grasped that successful technological change has an important social dimension and needs to be viewed in the context of development.

## Reflection

The experience gained in the TRANSCOL project is relevant for other countries, where it may even be more positive as the achievements in Colombia were partly constrained by the difficult situation in several of the project communities because of security problems in the country and particularly in rural areas. This has led to people leaving their villages (brain drain) thus putting a strain on the sustained management of the systems. Other communities grew excessively because of the influx of rural dwellers, putting a lot of pressure on a quick expansion of the treatment system, which can be more easily accomplished with (less sustainable) chemical water treatment. Some also may have been afraid to participate actively in the project and develop participatory leadership in a political unstable environment. Despite these limiting factors results are positive and clearly show that the TRANSCOL programme has many characteristics of a Learning Alliance as defined by Moriarty et al (2005).

- **Transcol a learning alliance ´avant la lettre´**
  The shared interest of TRANSCOL was the scaling-up of Multi Stage Filtration in Colombia later on also encompassing an inter-institutional and inter-disciplinary approach to working with communities. The approach valued institutional, academic and community knowledge and promoted mutual respect. This was very much founded in the team-work of the CINARA and IRC staff. Although IRC was responsible to the Netherlands government, decisions were always made as a team in a very transparent environment. Dialogue and experimenting are the key words to characterise the programme. The dialogue very much allowed sharing views in an open way and stimulated experimentation with new approaches to find new answers.

- **Sustaining the learning alliance**
  Sustaining the core team (CINARA and IRC) of the learning alliance was relatively easy as financial resources were available from the Dutch government and a clearly shared objective was established that was supported by the management of the participating organizations. Sustaining the IRWGs (the alliances at the regional level), proved much more difficult as different degrees of importance were attributed to water quality improvement and to working in a participatory way with the community and other institutions and these were competing with other daily activities.

  At the community level, after an initial period of inertia, quite some people became involved, but not everyone if only because the interest in water quality improvement was not fully shared. A large number of people were more concerned with water quantity. Sustaining the vertical linkages between the different platforms was an important element of the programme. This was very much supported by its flexibility to adjust both its strategy and its implementation schedule. Initially the programme was formulated for three years, but in close consultation with the Netherlands government, the leading funding organization, it was agreed to take a much more flexible approach. This facilitated the search for local resources, which could be found more easily for the

construction of water systems. When this became apparent DGIS agreed to shift funds originally earmarked for construction to training and facilitation allowing a much longer and more frequent intervention by the teams from CINARA.
The flexibility of the process also allowed for elements of redesign and learning which according to Leeuwis (2004 p. 12) are essential elements in the scaling-up of tailor made innovations to different contexts and people. After the programme came to an end, vertical linkages continued to operate between particularly the regional health services and communities. But approximately one year later these came to a halt, when the official mandate of the health service changed, from responsibility for rural water supply construction, to only surveillance and control, a change that was accompanied by a severe cut in the budget.

- **Leadership of and facilitation by CINARA essential**
  The leadership of the CINARA team was crucial for the programme and the learning alliance. It developed a really new way of working but in a sense it may have been too enthusiastic in taking the lead. People in the communities better remember the staff from CINARA than the inputs from other agencies. This seems to suggest that CINARA staff really learned to facilitate the work in the regional groups and the communities. This is encouraging because for many of them this was their first experience with this. The downside is that they were still so new on the job that they were leaving fewer learning opportunities for the staff from the other agencies to practice as a process facilitator. This underscores the importance of facilitation that is a key skill for the orientation of learning processes.

- **Learning project approach has potential**
  The learning project approach as developed in TRANSCOL has a great deal of potential. It changed the views of the staff involved making them better professionals with more appreciation for communities and for the importance of inter-disciplinary team work. The approach does, however, need fine-tuning to become more effective on an institutional level. This particularly concerns the political embedding of the approach to ensure longer-term support and a more comprehensive approach to participatory problem identification at community level, together with agencies that can continue to support the communities and that are prepared to make a commitment for this longer term support. So the approach could have worked better if:
  - Stronger institutional commitment would have been obtained
  - A more comprehensive situational analysis would have been made with even more attention for the logic of social processes and water ecology
  - Guidance would have been provided for a longer period of time to better learn about the deficiencies

- **Change in thinking essential**
  TRANSCOL comprises the ingredients for a change in thinking about the need for a more ecologically sound water supply service in which water quality and the social process are taken seriously, but this has not yet materialised. This necessary change can very well be compared with the shift from conventional to ecologically sound agriculture which often implies a shift from strategic manoeuvring to consensual decision making based on negotiated accommodation of interests and on social learning of new shared perspectives (Röling and Jiggins, 1998). MSF, often the most suitable water treatment process for community water supply using surface water sources, requires this new perspective. It requires, as Leeuwis (2004) calls it, new forms of co-ordinated action and co-operation characteristic for the management of collective natural resources.

  An important change is also needed in University education as this proves to be an important channel for technology and methodology transfer. It is time that the management of the universities agrees that the technological logic their programme encompasses is not truly contributing to solving the complex problems of the water sector. This would require that students get a much better understanding of sustainable human development and also grasp the logic of the social processes (interactions between people and people and technology) and the water ecology that is a part of most water treatment.

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