

Libya is also of great interest to other countries as a case study in gas development. In particular, as the book outlines in great detail, Libya exhibited all the classic problems associated with LNG projects, ranging from technical difficulties to the problems of operating with contracts in periods of rapid market change.

Finally, Libya provides an excellent case study of the imposition of economic sanctions. The process began in May 1978 with the US banning military exports. This escalated in 1981 with the US requesting all US citizens to leave, and in March 1982 with an effective trade boycott by the US. At the start of the 1990s, UN involvement increased with progressively tougher sanctions. The main conclusion which this reviewer draws from the book's observations and analysis is that sanctions simply do not work in achieving their objectives. In particular, instead of weakening the political control of the current regime they have, if anything, strengthened that control. The only effect seems to be to decrease the living standards of ordinary people. Parallels with sanctions against Iraq are irresistible. One wonders if the sanctions against that country will be maintained for as long as they have been against Libya, with equal ineffectiveness in terms of the political intent. Unfortunately, the book appeared before the various secondary boycotts planned by the US (including the D'Amato Bill) took concrete form and the author could only briefly allude to them. A more in-depth discussion would have been of interest.

There is a chapter on the general impact of the oil and gas sector on the economy, which concludes that Libya is poor because of a paucity of other factors of production with which to build a viable economy. There are other small poor countries which may well draw lessons from this, thereby preventing some of the excessive waste detailed in the book which seems to go hand in glove with natural resource windfalls. The author points out that the only obvious comparative advantage for Libya lies in tourism. However, that option requires certain fundamental changes before it becomes feasible.

The book contains a wealth of detail, despite the severe data restrictions which make current assessments difficult. It is also full of analysis of the detail which gives it wider relevance as a case study.

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Community Participation: So What? Evidence from a Comparative Study of Two Rural Water Supply and Sanitation Projects in India

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Participation by beneficiaries has become a major component in many development projects, and to express doubts as to whether such participation does in fact lead to better outcomes is now almost heresy. The rationale for it in the literature and in various project documents has been varied. It is seen as a means of increasing: the effectiveness and efficiency of projects (Paul, 1987; Cernea, 1992), the coverage of a project with a given budget through cost-sharing (Paul, 1987;¹ Finsterbusch and Van Wicklin, 1987), and the sustainability of a project through the enhanced commitment of the beneficiaries, especially if they share the costs (Dichter, 1992). Proponents of the 'alternative development' school (Gamer, 1976; Botkin et al., 1979) see participation as a vehicle for beneficiaries choosing their own path to development and preserving their indigenous skills, and, in an extended version of this argument, as a means of widening the choices available to them and of capacity building and empowerment through putting 'the last first' (Paul, 1987; Finsterbusch and Van Wicklin, 1987; Cohen and Uphoff, 1980). To the advocates of building from below, participation is a means of building the capacities of grassroots and local institutions (Bhatt et al., 1987).² Beneficiary participation seems to be regarded as the antidote for the well recognised drawbacks of the centralised service delivery approach, namely, (i) its limited reach, (ii) its inability to sustain the necessary local action, (iii) its limited adaptability to local circumstances, and (iv) its creation of dependence on government institutions (Korten, 1981).

However, the question of what in fact has been the impact of beneficiary participation on development projects seems to have received less attention than

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1. For example, the appraisal mission of the Netherlands Government sent to Kerala, in its report KE-4 produced in 1982, sees cost-sharing as a means of increasing the number of beneficiaries (pp. 5-6).

2. A number of papers in this volume build on this theme. See, for example, those by Ledivina Carino and Wilfredo Carada, Asoka Gunawardena, and Govind Agarwal and Prakash Pant.

the often value-laden rhetoric and strident advocacy. Empirical studies seeking to determine its impact on the outcome of projects have been few, and the empirical evidence is still somewhat inconclusive.

This article takes a step towards building such empirical evidence. Unlike other studies undertaken so far, it compares two rural drinking water supply projects which were otherwise very similar, but differed in the way they incorporated beneficiary participation. Both projects were in the State of Kerala in India; both were piped water schemes delivered by the same public authority, but while one project had planned for and achieved considerable participation by the beneficiary community, the other contained no community participation component. The study demonstrates that there is clear evidence that beneficiary participation does indeed lead to better project outcomes, and explores the linkages between the two.

Since in the first project the participation elicited was from the community as a whole and not from the beneficiaries alone, the term 'community participation' (CP) rather than 'beneficiary participation' will be used henceforth in this article. The article is in four sections. The next section reviews the evidence available so far on the impact of community/beneficiary participation on project outcomes. The setting and methodology of the study are then presented, followed by a discussion of the results and finally the implications of the findings.

CP and project outcomes: evidence thus far

The outcomes of most development projects depend on a large number of factors besides community participation; assessment of the impact of participation is therefore, by its very nature, difficult. Nevertheless, some studies have been undertaken linking community participation to project outcomes. These can be grouped into two categories. The first are in-depth case studies of a small number of projects showing either how CP resulted in improvements in some aspects of project design, implementation and outcomes or how the lack of CP led to dysfunctions in the projects or even to their failure. The second group seeks to establish statistically the relationship between participation and project performance, taking large sample sizes and adopting the systematic case review method.

Among the in-depth case studies, that of development projects in Africa by Uma Lele (1975) is among the earliest. Lele found that popular participation played an important role in need assessment and project design and implementation. Participation was found to have led to improved design and cost-sharing (usually through labour contributions) in some cases, but more usually the finding was that the neglect of local inputs had an unfavourable outcome on project performance. Lance and McKenna (1975) analysed 50

programmes involving the introduction of technological change, 21 of which were fairly successful; most of the successful programmes had a CP element. In later studies a participative farmers' group programme in West Java, Indonesia was found to have resulted in improved rice productivity and the acquisition of capability for managing production and marketing activities locally (Husein et al., 1987); a community-based health care programme in Sri Lanka was found to have resulted in the provision of low-cost and effective health care to the community (Gunawardena, 1987) and a farmer-controlled community irrigation system was found to have led to better design of the irrigation system and to have increased the problem-solving capabilities of local farmers (Alfonso, 1981). In the field of drinking water and sanitation, case studies by Briscoe and Ferranti (1988) sought to establish the link between participation and performance. A potable water project in Tunisia was found to have suffered because lack of participation led to serious problems in the design and implementation of the project; poor quality of participation led to serious undermining of a similar project in Peru (Finsterbusch and Van Wicklin, 1987). Isham, Narayan and Pritchett (1994) document two case studies, the Agathi Rural Water Supply Project in Kenya and the Waniata, Air dan Sanitasi (WAS) in Indonesia, where the projects were first implemented without CP and ran into difficulties and then improved their performance after CP was introduced (the first project was redesigned). In a comparative study of five water and sanitation projects in India, varying modes and intensities of participation were found to have affected the project outcomes in specific ways, especially in project design for levels of service, awareness of health issues, changes in sanitation-related habits and conflict resolution, although the correlation between the overall levels of participation and the outcomes was somewhat weak, 0.21 (Manikutty et al., 1996).

The findings of these case studies are difficult to generalise because of the small number of cases studied and the informal methods used in some of them (Isham et al., 1994). Of greater concern to the researcher is the existence of other case studies of projects which were successful but contained no element of CP, and studies which show no link between participation and outcomes. Thus Paul (1987), in his study of 50 development projects of different types, found that ten of them did not incorporate any CP at all but were considered successful. They seem to have performed well mainly because of the efficiency with which the implementing (government) agency assessed the needs and implemented the project. Thus efficient implementation, even without CP, could result in an effective project. A similar conclusion emerges from a study by Chauhan (1983), which demonstrates that in the 8 projects studied, even though, on the surface, CP appeared to have played a major part, the key persons who 'put the water in the taps' were dedicated professionals rather than community members. Cernea, after a study of 25 development projects, found that participation did have an impact, but only if coupled with institutional development to

sustain it. Thus institutionalisation of participation may be more critical than participation itself (Cernea, 1987).

Because of the difficulties in generalising and the seemingly contradictory evidence from case studies, some researchers have attempted to apply the systematic case review method (for example, Esman and Uphoff, 1984; Finsterbusch and Van Wicklin, 1987). These studies rely on a large number of case studies prepared by others, on the basis of which scores are assigned by independent researchers to outcomes and participation in addition to other variables which, in their judgement, could affect the outcomes. Correlation coefficients are then derived between the variables studied.

These seem to vary considerably across the studies. Thus Finsterbusch and Van Wicklin (1987) found adequacy of communication and beneficiary commitment to the project to be the major significant variables, rather than CP. The average correlation coefficient between participation and project effectiveness was only 0.26, and the authors state that 'this finding appears to contradict the literature which strongly advocates participation as crucial for project success' (p. 16). The study showed, however, the importance of participation as increasing at successive stages of the project, with the O&M stage showing the highest (0.37). Though small, the values of some stages were significant at the 0.05 level. Thus, another interpretation of the findings (as the authors point out) is that, while participation may not be crucial to success, *ceteris paribus* participatory projects are more likely to be successful than non-participatory projects.

Deepa Narayan, in her study of 122 projects across different countries, found a fairly strong correlation — a zero order correlation of about 0.6 to 0.76 — between participation and overall project effectiveness (Narayan, 1992).³ In another study of 121 projects, Isham, Narayan and Pritchett (1994) found correlation coefficients of about 0.62 in the bivariate and 0.24 in the multivariate analysis. In both these studies, however, a number of other variables also emerged as important determinants of project effectiveness.

Systematic case studies, despite the care taken in their design and interpretation of the data, still suffer from major problems which leave one with a sense of unease. One difficulty has been the veracity of the ratings for the variables given by the experts and researchers who had not themselves prepared the case studies. Care has been taken in the studies to establish the agreement among the experts by calculating the inter-coder correlation, but their ratings would still depend upon the way the case studies were originally written and the purposes for which they were written. A much more serious problem is that case studies from projects from different countries and executed under very different conditions are clubbed together and the correlations derived. Lastly,

these studies attempt to correlate project outcomes with CP, but it is well known that outcomes depend upon many other variables besides CP, and hence the contribution of participation to project effectiveness in any multiple regression analysis is bound to be relatively small. Thus, valuable though these large sample statistical studies are, the conclusions still have a thick smog of tentativeness around them.

Neither isolated and scattered case studies nor large sample statistical studies therefore seem to have built up particularly strong evidence on the role of participation in project effectiveness. Thus, to complement the above findings, it would be useful to have studies that compare directly projects that are otherwise similar but which differ with respect to whether they have incorporated CP. This is what we have attempted to do in the study outlined here.

Setting and methodology of the study

The setting

The study was conducted in the State of Kerala, India, which is situated in the southernmost part of the subcontinent in a narrow strip of land between the Arabian Sea and the western mountain range. Though it has a high average rainfall of 3085 mm, there are few dams and, because of the narrow width of the land (averaging only about 70 km.) and its slope, the rain water flows into the sea very quickly. The rainfall season lasts about four months; five months (January to May) are dry, and rivers, ponds and wells run dry and in many areas drought conditions prevail. There are also problems of salinity in the coastal regions. Thus in spite of high average rainfall, the need for drinking water is acute in the rural areas in the summer months, and the projects studied addressed themselves to this need.

The density of population is very high, nowhere less than 900 persons per sq. km. (except in some hilly areas) and in many cases as high as 2,600. Boundaries between adjacent villages or between the sub-units called 'wards' are artificial in most cases.⁴ Houses are built very close together with few open spaces for defecation (as in many other parts of India). This makes household latrines a necessity and their potential for contamination of nearby wells is also very high,⁵ thus leading to serious negative externalities.

4. A typical village in Kerala is large, with about 25,000 inhabitants; each is subdivided into 'wards' of about 2,500.

5. A distance of at least 10 metres is considered essential between a well and a latrine to

Kerala is considered an exceptional Indian state in terms of human development, with a literacy rate of 90% in 1991, and a female/male literacy ratio of 92% (Chakrabarthi and Pal, 1995). There is a good health system, accessible to a large section of the population. The infant mortality rate and life expectancy in 1991 were 17 per thousand and 69 years respectively (*ibid.*), these figures being not only the best in India but comparable to those of many developed countries; but the morbidity rate, especially among children, is high, at least partly due to pollution of drinking water. The degree of political awareness is very high, with functioning village-level democratic institutions called *panchayats* — bodies of elected representatives with a bureaucratic executive — and many active grassroots local organisations such as youth, women's and sports clubs. The state has a history of social movements, many with active participation from the community, such as, for example, the much publicised total literacy drive, and the grassroots organisations have played a prominent role in these movements.

Kerala has a good traditional water source system of wells and ponds; many houses have their own wells and villages have community wells. There is a strong tradition of using well water for drinking and cooking, and a belief that this water is generally safe (although a study revealed that most of them are contaminated beyond safe levels).⁶ Many of the wells are not covered (by wire meshes, etc.), and many do not even have a parapet wall to prevent ground water from seeping into them. Despite the high literacy rate, surprisingly the health awareness of the people is not particularly high. Hence there is a need to educate them about the hazards of using water from wells, especially for drinking, without boiling it. Many traditional beliefs exist, and are difficult to change. For example, most people believe that well water is safe, and that children's faeces are harmless, so that no particular care is needed in handling them. These beliefs and the consequent habits affect people's health, however, and changing these beliefs is essential in a programme aimed at improving health standards and morbidity rates.

Because of the scarcity of safe drinking water (in fact of water in general) during certain times of the year in many areas of the state, a number of water schemes are in operation, some assisted by bilateral and multilateral agencies and some financed by the government through loans from Indian institutions. Practically all these schemes are for piped water. One of the projects covered in this study was assisted by the Government of the Netherlands and Danish International Development Assistance (Danida); the other had no assistance from bilateral or multilateral donors. Both were implemented by the Kerala Water Authority (KWA), a government corporation charged with implementing all water projects in the state.

6. See Kerala State Pollution Board and Socio-Economic Units, Kerala Water Authority

The Dutch-assisted schemes (in southern and central Kerala) were initiated in the 1980s, inspired by the launching of the International Drinking Water Supply and Sanitation Decade (1981–90). For certain reasons, the Danish-supported schemes (in northern Kerala) were started only after 1987. However, the Dutch and Danish governments agreed to work together; an office for overall co-ordination was set up, the costs being shared by the two governments. Thus this was, for all purposes, a single project whose objective was improvement in the health of the beneficiaries, not merely the supply of water. It was a drinking water-cum-sanitation project, the linkage between the two being considered vital in view of the effect each has on the other.

CP in the two projects

Community participation was envisaged in the Dutch/Danish project from the very beginning. Even though the community was not involved in the assessment of needs, the selection of areas to be served or the technologies to be used, local people were actively involved in the location of the standpipes (standposts) and the building of health awareness, and to a small extent in the construction (contributing labour and, in a few cases, land for the standpipes) and in maintenance (mainly reporting of faults). The participation of the beneficiaries was mobilised by three Socio-Economic Units (SEUs) set up for the purpose in the northern, central and southern areas, and an overall co-ordinating office at Trivandrum, the state capital. These SEUs were headed by social scientists, with support field staff, and had units at the *panchayat* level, with one field officer for one or two *panchayats*. They were funded by the Dutch and Danish governments but were to operate as units assisting and responsible to the KWA, with which they were to work closely. It was expected that they would serve as the link between the community and the KWA, co-ordinating the training and community mobilisation activities, on the one hand, and the actual implementation of facilities by the KWA, on the other, and bringing about an institutionalisation of the CP process in the KWA, which was an engineering organisation with no experience of work related to community participation.

In the Dutch/Danish project, Ward Water Committees (WWCs), consisting of seven members, two at least of whom had to be women, were set up in each ward of the *panchayats*, all of them nominated by the community except for the ward's elected representative to the *panchayat* and a nominee from the government health department; usually two would be from local grassroots organisations, and one would be an active social worker or school teacher. Thus a link was forged with the existing local democratic and grassroots institutions. WWCs decided on the location of facilities, the withdrawal of facilities (if not needed), and the persons eligible for household latrines (latrines under this project, carrying a 75% subsidy, were given only to those below the poverty

level), organised and monitored the construction of latrines, selected the caretakers for water standpipes (who were voluntary workers and received no payment), organised maintenance (mainly reporting of faults to the KWA; some elementary repairs were also done by the caretakers), and served as the link between the *panchayat*-level committees (*Panchayat Water Committees*) and the community. It was clearly understood that, though SEU staff would assist them in the beginning and whenever necessary later on, it was the WWCs which were the decision-makers. The idea was to enable the WWCs to function on their own, so that, after the completion of the project when the SEUs would be wound up, the WWCs would continue to function. It should be noted, however, that the KWA was the authority responsible for the technical design, construction and operation and maintenance of both projects, all the repairs (except for minor ones) being carried out by KWA personnel only. WWCs could facilitate the process through quicker transmission of information about defective taps and follow-up, but could not undertake any repairs (except very minor ones) on their own or entrust them to any agency other than the KWA.

Great importance was attached to participation by community members in the location of the standpipes. The involvement of women was especially sought in the decision-making (most of the water collection is done by women). Maps showing the location of all households (with different indicators for different income groups), roads, schools, hospitals and childcare centres were prepared for each ward and the proposed location of standpipes was marked on them. Prepared by the WWC members, with active involvement from the community members, these maps were openly displayed in the *panchayat* offices and objections and suggestions were invited from community members. In many cases, the sites for standpipes were changed as a result. This introduced transparency into the procedure, and greatly reduced the potential for conflict and rent seeking by the elite (by hijacking facilities or using their influence to position the pumps to favour some people).

CP was elicited in a variety of ways. For example, the trainers in health awareness building programmes were local people; a programme for the chlorination of wells was carried out through local women; and local women masons were trained to construct latrines. The latter two activities also resulted in some supplementary income generation.

CP was thus an integral part of the Dutch/Danish assisted project. In contrast, the project directly implemented by the KWA did not envisage CP in any form. It was seen simply as a water supply project, and the KWA engineers designed the project and located and constructed the facilities in their own way. In some cases, the local elite were consulted but the ordinary beneficiaries were not aware of the outcomes of these discussions. There was no sanitation element in the project. There were also no programmes to build health awareness.

In both schemes, the KWA was to recover from the *panchayats* an amount of Rs.875 (about \$24) per standpipe per year. This was met from the *panchayat's* overall tax revenues (which included many items of taxation).

Thus the two projects selected for the study were essentially similar, except as regards the element of community participation.

Selection of villages for the study

Both projects covered many areas all over the state. It was thus possible to select pairs of villages, one served by the Dutch/Danida project and the other by the KWA project, that were geographically near each other. It was ensured that, in the villages selected, the facilities had been completed and the supply was continuing for at least two years. Four such pairs of villages were selected,

Table 1
Some particulars of the villages studied

<i>Dutch/Danish project</i>					
	<i>Population (approx.)</i>	<i>No. of households</i>	<i>No. of standpipes</i>	<i>Sources of water</i>	<i>Panchayats</i>
Ward A	2,318	391	10	Public standpipes and a few private connections	Functioning
Ward B	2,725	644	12	Ponds, wells, standpipes	Functioning
Ward C	3,500	400	12	River, open wells, standpipes	Functioning
Ward D	2,300	350	5	Wells, 1 bore well and standpipes	Functioning
<i>KWA project</i>					
	<i>Population (approx.)</i>	<i>No. of households</i>	<i>No. of standpipes</i>	<i>Sources of water</i>	<i>Panchayats</i>
Ward E	3,200	982	9	River, wells, 1 bore well and standpipes	Functioning
Ward F	3,600	1,060	5	River, wells, 1 bore well and standpipes	Functioning
Ward G	4,500	886	7	Wells, standpipes	Functioning
Ward H	2,800	531	5	River, wells,	Functioning

and in each village, one 'ward' was selected at random to be the unit for our surveys. Table 1 gives the basic features of the villages selected.

Variables studied

The dependent variable studied was the outcomes of the two projects, which were measured along the following dimensions.

(i) **Technological outcomes.** Under this head, the quality of water supplied and the percentage of taps in working condition were measured. Since what influences the use of the project source by the beneficiaries was considered likely to be the *perceived* rather than the actual quality of the water (as revealed by objective tests), the perceptions of respondents about the quality of water (to be classified as excellent, good, satisfactory or unsatisfactory) was surveyed, supplemented by our own visual observations of the water coming from the taps and its taste. The percentage of taps in working condition was determined by a headcount of taps working in each ward studied, carried out on two days a month apart, and the average taken.

(ii) **Use of project source.** This refers to the extent to which the project was able to induce the beneficiaries to use the water supplied (which is treated and safe) rather than the traditional sources. This indicator is particularly useful in a state like Kerala where there is abundant water during the rainy season and people may prefer to use traditional sources (especially wells). The questions put to the respondents were whether they had switched over to the water supplied by the project for drinking and/or cooking, whether this switch was total or partial, and whether they used the project water in all seasons or in particular seasons only.

(iii) **Changes in habits.** The extent to which each project led to change in the habits (mainly health-related habits such as covering vessels used for storing drinking water and water for cooking, storing the vessels at a height, using a ladle with a handle to remove water so as to avoid finger contact, usage of the latrines and keeping them clean) of their beneficiaries was determined by questions to the respondents, supplemented by observations wherever possible.

(iv) **Continued community involvement.** The degree to which the community is involved on a sustained basis gives an indication of the sustainability of the project itself. This was measured by ascertaining the perceptions of the beneficiaries as to (a) whose responsibility it was to keep the area near the standpipes clean and (b) to keep the facilities working, and (c) the initiatives taken by them to get defects rectified. The extent to which members of the community felt it was a part of their responsibility to keep the facilities working and the area near the standpipes clean was considered to be an indicator of the community's continued involvement in the project. This was supplemented by our own observations on how well the areas near the

standpipes were maintained. We also looked at the continued functioning of the WWCs and the extent of the cost recovery in the two schemes.

(v) **Satisfaction of beneficiaries.** This was measured by a direct question as to the extent to which the respondents were satisfied with the facilities provided by the project and their functioning.

The study was carried out by means of a questionnaire survey supplemented by less structured interviews. Two leaders or influential village members (such as school teachers or social workers) were interviewed in each of the selected wards to assess their involvement in, and perceptions of, the project. In each of the selected villages, 20 community members were also interviewed, chosen at random and half of them women. Even though a random list of households was drawn up for each ward, the members actually interviewed were those who were available and willing to be interviewed. Care was taken to ensure a mix between different income strata and caste groups.

Results of the study

Here we compare the outcomes in the villages served by the Dutch/Danish project (Project I) with those in the villages served by the KWA project (Project II).

(i) **Technological outcomes.** These were as given in Table 2, which shows the percentage of respondents answering in the affirmative.

The quality of water in Project I was stated by respondents to be 'satisfactory' or 'good', although many complained about the smell and taste due to the *chlorination treatment*. However, in Project II, in no case was water considered 'good' or 'satisfactory'. We also found that there was indeed a substantial difference in the visual quality of the water in the two projects. This was partly explained by the fact that the purification facility had not been set up in one of the project areas in Project II⁷ (the other areas, however, had functioning purification facilities).⁸ Also, it seemed possible that the pipelines in Project II had deteriorated and this was perhaps a reason for the poorer quality of water. But the important point was that, whenever the quality of water in Project I showed deterioration, the WWCs, *panchayats* and SEUs brought it to the attention of the KWA and brought pressure to bear on the Authority to

7. This was due to some delays; purification was part of the project.

8. Only one of the four villages studied had this problem. A check on the response pattern of this village showed it to be not significantly different from the rest: 25% responded that the water was 'brackish', 40% said it was 'muddy' and 35% said it was unclean. It is possible that

Table 2
Technological outcomes in the villages studied (% of respondents for item 1)

	<i>Project I</i> <i>n=80</i>	<i>Project II</i> <i>n=80</i>
Perception of quality of water	'Satisfactory': 40 'Good': 60	'Brackish': 25 'Muddy': 25 'Unclean': 50
% of taps working (determined by actual count)	92	74 ^a

^aDifference significant at 0.01 level.

improve matters, whereas such mechanisms did not exist in Project II. As a result, the attention given by KWA to complaints differed in the two projects.

The percentage of taps working in the Project I villages studied was strikingly different from that in Project II (92 as against 74%). Project I villages had an efficient mechanism for the quick reporting of faults and their follow-up, while Project II had none. In fact, Project II villages had no records to show how many taps were not working on a given day and from what date they were not working, while in Project I villages each defective tap was recorded by the caretaker of the ward in a register and the date of reporting entered. The *panchayat* office kept a record of all defective taps, and followed up the repairs with KWA maintenance personnel. The involvement of the beneficiaries was also different in the two projects. The typical response of Project I villagers was: 'It is our responsibility. Any of us going to the town (where KWA's offices are located) would report the fault or follow it up,' whereas in Project II areas the typical response was: 'It is KWA's responsibility to maintain the taps. It is not our job to follow it up.' The difference in the percentage of taps working in the two sets of villages thus seems to be largely due to the participatory maintenance and follow-up systems in Project I.

Local knowledge was used to modify designs in Project I. Thus the design of standpipes and drains was adapted to suit local conditions based on inputs from local people; for this reason and because of the greater involvement of the community (see item iv below), the standpipe areas in Project I were generally clean. In Project II, the designs were usually standard and the views of the local people were not sought; many standpipe areas were dirty and had very poor drainage.

(ii) **Use of project source.** The percentage of people who had switched over completely to the 'safe' water supplied by the project was much higher in the Project I villages (about 40%) than in Project II villages (about 25%), as shown in Table 3. The remainder continued to use the old sources, mainly wells.

Table 3
Sources of water used by respondents (%)

	<i>Project I</i> <i>n=80</i>	<i>Project II</i> <i>n=80</i>
<i>A. For drinking</i>		
Traditional sources (mainly wells) alone	14	19
Piped water alone	39	25 ^a
Traditional sources as well as piped water	47	56
<i>B. For cooking</i>		
Traditional sources (mainly wells) alone	46	50
Piped water alone	40	27 ^a
Traditional sources as well as piped water	14	23

^aSignificant at 5% level of significance.

The reasons for changing or not changing to the project facilities could provide insights into how the project was seen by its beneficiaries. We therefore asked those who continued to use water solely from wells or along with the piped water the reasons for their use of different sources. The answers from the two projects were strikingly different (see Table 4). In Project I areas, safety was the reason mentioned by most of the respondents for using piped water, and proximity of the source by the rest (mainly those who did not have their own wells). The main reasons for using well water were non-availability of piped water for various reasons (such as breakdowns and inadequate pumping of water at source) and, to some extent, proximity of the source (often in the compound itself) and the 'safety' of the well water. In Project I areas, only 30% of those using wells did so in all seasons; they used it as a supplement to piped water especially in the lean season when the supply of piped water was less. In Project II areas, the reasons for using piped water were proximity of the source and greater quantity of water; the better safety of piped water was not mentioned even once (not surprising, since the quality of the piped water was not good). On the other hand, wells were used whenever they were near and

Table 4
Reasons for usage of different sources for drinking (% of respondents)^a

Reasons	Project I		Project II	
	Solely wells (n=11)	Wells and piped water (n=38)	Solely wells (n=15)	Wells and piped water (n=45)
Source is closer	23	21	37	31
Better taste of water	5	0	27 ^c	5
Safety of water	27	56	30	0 ^d
Greater quantity of water	0	0	6	27 ^d
Other reasons ^b	45	0	0 ^c	12 ^c
Using well only to supplement piped water	-	23	-	25
Total	100	100	100	100

^aOnly those who use traditional sources, solely or along with piped water.

^b'Other reasons' included need for privacy (the wells being within the house compound), not being willing to queue up and mix with others and the piped water not coming at a fixed time. It may be noted that, despite the high percentage, the base number is small.

^cDifference between Projects I and II significant at 5% level.

^dDifference between Projects I and II significant at 1% level.

because of their better taste. 92% of those who used wells in Project II areas did so in all seasons.

Thus it would seem that Project I succeeded in building up a much higher level of awareness regarding the risks of contamination from traditional sources. This was done through awareness building campaigns, which community members took an active part in organising and in which many worked as trainers themselves. Volunteers took an active part in supplementing formal sessions with house-to-house discussions. On the other hand, in Project II areas, the respondents saw the piped water mainly as a supplement to well water (when wells dry up) or as a convenience. The beneficiaries were not educated as to the health hazards of using traditional sources; failure to supply water of good quality further reduced the chances of the use of the project source.

Interestingly, the Dutch/Danish project personnel seemed to have realised the difficulties, because of established habits, in inducing the beneficiaries to change fully to piped water. They therefore started a scheme of chlorinating the existing wells⁹ to eliminate contamination. This programme, again, was a community-based one undertaken by village women who did the chlorination

for a small charge, keeping the profits generated for themselves (for details see Manikutty, 1995a). Thus this initiative reduced the hazards of contamination while increasing the scope of participation.

(iii) **Changes in health habits.** The health awareness programme conducted in Project I villages stressed the importance of covering drinking water vessels, storing them at a height and avoiding finger contact when taking the water from the vessels. As regards sanitation, the need to keep adequate water near the latrines and to flush them immediately after use was stressed. Dangers, both to themselves and to others, of defecation in open spaces was highlighted, especially with regard to young children who often do not use latrines even when the house has one. All this was done because the project had improvement of health as its objective, and so the linkage between health and sanitation was constantly kept in view. Project II, on the other hand, contained no health awareness building component.

From our survey and observations, we found some differences between the health habits of the beneficiaries in the two projects. No great difference was noticed in the habit of covering the vessels containing drinking water (most did), storing drinking water at a height (only a few did) and taking the water from the vessel with a help of a tumbler with a handle so as to avoid finger contact (hardly anyone did). But while 37% of the respondents in Project I filtered the water before drinking, only 3% in Project II did so. Usage of household latrines was also very different in the two projects (among those who had their own latrines). While 94% in the Project I villages used their latrines, 34% in Project II continued to use open spaces despite having their own latrines, simply out of habit.⁹ Similarly, while 85% of the children in the Project I villages used their household latrines, only 44% did so in the Project II villages. The Project II respondents had no idea of the health hazards to other members of the community arising from their habit of defecating in open spaces. In Project I villages 99% of the latrines had water kept ready near them, while only 67% in Project II areas did. Since the villages studied were geographically contiguous in pairs, there is no reason to believe that they differed in the people's habits initially. The different habits observed can be safely attributed to the impact of the health awareness building programmes carried out in Project I villages.

As noted above, these programmes were not simply information dissemination programmes; the village people were involved in organising them, becoming trainers themselves and reinforcing the messages. Local village-level workers, known as *anganwadis*, who function as caretakers for children, teach them and give them a meal under the Government of India's Integrated Child Development Scheme, were used, as were schools, to convey health messages

9. This cannot have been due to differences in the availability of open spaces. The selected villages were essentially similar with regard to housing density.

to children, who, it was hoped, would influence the health habits of their parents and other elders in their homes. The SEU staff gave them the necessary support when required.

(iv) **Continued involvement by the community.** To assess the extent to which the community continued to be involved after the completion of the project, three questions were asked in the survey of beneficiary respondents, followed by unstructured interviews, namely: (a) whose responsibility did they think it was to keep the standpipe area clean; (b) what action would they take if the designated person or agencies (the caretakers and/or KWA personnel) failed to take the necessary corrective steps; and (c) had they taken any initiative in the past to report defects or get them rectified? The responses received were dramatically different in the Project I and II areas, as can be seen from Table 5.

The responses to the second and third questions clearly show that the community members in Project I seem to have a higher degree of self-reliance and are willing to exercise more initiative as compared with those in Project II. The responses to the first question indicate that the respondents in Project II seem less willing to keep the premises clean by their own efforts (it is the government's responsibility) than those in Project I (the caretaker is also a volunteer from the village itself and receives no payment).

It is possible that the respondents' actions were quite different from their responses. These data were therefore supplemented by our own observations. In Project I villages, the caretakers and WWC members knew which pumps were not working and when they went out of order, and followed up the repairs. Fairly good records were also kept. The members of the community we spoke to said that they were 'their taps' and if they were not functioning properly, this was not in their interests. There was also a feeling of empowerment expressed by a number of respondents in statements such as 'The KWA has to repair it (the tap). We will get them to do it.'

In contrast, in Project II areas, there was no such sense of ownership. It was 'their (i.e. the government's) job' since the facility was 'theirs': a typical attitude towards facilities provided by the government, which is seen as the provider of all benefits, and even when it fails to deliver them, local self-help initiatives are infrequent.

The appearance of the standpipe areas in the two projects was strikingly different. In Project I villages, they were generally clean, and instances were recounted of the community members taking the initiative to clear up the drainage when it became clogged. They also made suggestions for modifying the design of the apron and drainage around the standpipes based on their understanding of local conditions. These changes had a favourable impact on the cleanliness of the area. In the Project II villages, on the other hand, the standpipes were generally dirty and no one seemed to be responsible.

Table 5
Continued community involvement (% of responses)

	Project I n=80	Project II n=80
<i>Question: Whose responsibility is it to keep the area near the standpipes clean?</i>		
Caretaker	23 ^a	0 ^b
All in the village	28	24
Those who use it	26 ^a	48
Government	9 ^c	26
No response	14	2
<i>Question: If you find a tap not working and the caretaker^d is ill or he/she is away, what will you do?^e</i>		
Wait till he/she gets well or returns	6 ^b	0
Do the job yourself	28 ^c	0
Do the job with the assistance of other community members	28 ^c	8
Get some other village members to do it	10	10
Nothing	0 ^c	63
No response/Do not know	28	19
<i>Question: Have you taken any initiative to report defects?</i>		
Yes	95 ^c	0
No	5 ^c	100

^aDifference not tested statistically, since the difference is mainly due to the lack of a caretaker.

^bDifference between the responses in the two projects significant at 5% level.

^cDifference between the responses in the two projects significant at 10% level.

^dThere were no caretakers in Project II.

^eIn Project II areas, we asked what they would do if the KWA mechanic was ill or away etc.

We also noted that, in Project I areas, WWCs continued to function, calling periodic meetings with the community members to discuss different issues. An interesting outcome in some Project I villages (not those covered in this survey) was that the *panchayat* and WWCs came to the conclusion that some standpipes provided earlier were not really required and closed them down. This saved them their payment for these standpipes (see below).

In two of the Project I villages studied, the project had led to demand for other facilities, notably revamping of traditional sources, more health classes and more latrines even at full cost (for those not eligible for the subsidies). In

Project II, on the other hand, we found no evidence of any other demands from the community.

(v) **Satisfaction of beneficiaries.** In Project I areas, 75% of respondents stated that overall they were satisfied with the project. Another 15% said they were moderately satisfied, while 10% said they were not satisfied, largely due to the non-supply of water on a daily and regular basis. On the other hand, in Project II areas, only 30% said they were satisfied with the project, 30% that they were moderately satisfied, while 40% said they were not satisfied.

Dissatisfaction in both projects was due to many reasons, the foremost being lack of timely and regular supply. The quality of the water supplied came in for criticism in Project II. Many respondents in the scheme where purification facilities had not been commissioned were aware of this, and in fact asked how the supply of such water could possibly lead to an improvement in their health. The location of standpipes was also a point of criticism. In Project II areas, the location of the standpipes tended to be near the main roads rather than where people lived (this was especially noticeable in one village in a hilly region where people lived in clusters away from the main road). This led to the beneficiaries having to travel some distance (sometimes half a kilometre) along hilly terrains, which they found very hard. In Project I, on the other hand, all the houses were mapped and in no case was the standpipe more than 250 metres from any household, and often much less. Respondents in both projects expressed their dissatisfaction with KWA's maintenance, but much more so in Project II areas.

An interesting source of dissatisfaction in Project II areas was KWA's provision of household connections. Three years earlier KWA had offered household connections at a charge of Rs.32 (80 cents) per month, and many people had availed themselves of this. The KWA was unable to ensure an adequate and regular water supply, however, and all the owners of household connections we met were dissatisfied with the poor supply actually delivered. On the other hand, those who did not take up this facility felt that, because of the household connections, their supply at the standpipes had deteriorated. There was thus dissatisfaction on both sides.

In Kerala, all *panchayats* receiving water from the KWA under any of its schemes have to pay a certain monthly charge (at the time of the study it was Rs.875 per standpipe per annum). The actual cost recovery from the *panchayats* falling under the Dutch/Danish project as a whole was strikingly different from that covered by other projects (none contained CP or had institutions like WWCs): 25% as against less than 10%.¹⁰ Though the actual recoveries depend on many factors, the extent to which the beneficiaries are satisfied with the

water supply is important. *Panchayats* where the beneficiaries were unhappy with the service were much more reluctant to pay (though they were legally required to do so) than those which were satisfied, according to interviews with elected members. Cost recovery, in turn, enhances the involvement of WWC members and beneficiaries in the project as revealed by such statements to us as: 'We have paid money for the supply. We therefore want a good supply.'

Conclusions and implications of the study

This comparative study provides strong evidence that CP does in fact lead to better outcomes. We found considerable, in some cases major, differences in the technological outcomes (mainly in the percentage of taps working); in the degree to which the beneficiaries had switched over to the water provided by the project; in the reasons for and for not changing over; in the changes in health habits; in the continued involvement by the community; in the initiative taken by the community to ensure the satisfactory working of the facilities and in the ability to exert pressure; and in the degree of satisfaction of the beneficiaries. The better outcomes in Project I also seem to have led to better cost recovery, thus improving the sustainability of the project.

There were, of course, differences in the two projects in terms of 'software' inputs. It is not possible to segregate the effect of these inputs *per se* from those of participation. The cost of these software inputs, however, did not form a substantial part of the total project cost. The original cost of all the schemes in Project I was Rs.1,324 million. The annual SEU budget for hygiene education, training, and all the associated establishment costs was Rs.2.5m. for the year 1994-5 (SEU, 1994). Thus even over the ten years the SEUs have been in existence, their total costs could not have been more than about 2% of the project budget. The differences appear to be not so much in the inputs as such, but in the way they were delivered.

The linkages between the superior outcomes in Project I and CP that emerge from the study are the following:

(i) **Better aggregation of preferences.** Since the facilities provided under most of the rural water supply schemes are facilities shared in common (such as public standpipes with one or more taps and handpumps), decisions on matters such as their location involve an aggregation of the preferences of individual potential beneficiaries. In many projects (as was in fact the case in Project II), some consultation takes place with some members of the elite, and since these are often the elected representatives of the people in local institutions, this may give an illusion of participation by the community. The leaders are supposed to 'reflect' the preferences of the community. But in elite-dominated societies, the eventual decisions are likely to reflect the preferences of the elite rather than of

10. The figures refer to the overall recoveries in the State, not of the particular villages studied

the community at large. 'Hijacking' of the facilities by the elite in the form of getting the common facilities located to their advantage (for example, in their own house compounds) and at times even denying access to others is known to take place (though we found no instances of this in our study in either project area).

Community participation, based on open consultation with all members of the community, provides a way of better reflecting their preferences. In Project I, mechanisms in the form of WWCs were put in place for such consultations, the expression of opinions and the raising of objections from aggrieved parties regarding the selection of sites for standpipes. The transparency of such procedures made it more difficult for the elite to impose their own views. The mechanisms and procedures devised led to the KWA locating the standpipes on the basis of the needs and preferences of the community rather than on its own preferences which were usually to locate them near the main roads. The mechanisms in Project I also led to better resolution of conflicts since the individuals or groups with different preferences were invited to open meetings, where it was usually possible to arrive at a satisfactory solution.

The determination of households eligible for latrines had the potential to generate conflicts. It could also become an instrument of patronage by the elite. The transparency of the procedures adopted, the nomination of WWCs as the bodies deciding eligibility and the system of inviting objections from aggrieved parties reduced the chances of unresolved conflicts and elite patronage.

Local institutions were interwoven with the WWCs through the inclusion of selected representatives. In Kerala, where political awareness is high, this mechanism made it possible to exercise the influence of elected members without their being able to exploit the meetings in their own interest.

Implications. It may not be enough to build CP into projects; care has to be taken regarding the mode of involvement and the mechanisms for doing so. Involvement of village leaders is no substitute for that of the community as a whole in development programmes, as Jain (1994) points out. The community at large needs to be involved, and when some sections (such as women and members of backward castes) are known to be reluctant to take part, care needs to be taken to mobilise their participation. These mechanisms need to be institutionalised, and the procedures for decision-making made transparent. There must be opportunity for aggrieved members to raise objections, and mechanisms to ensure that valid objections are given due consideration. Open meetings can serve as a powerful device for better conflict resolution and more satisfactory aggregation of preferences. If healthy local democratic institutions exist, they should be integrated into these new institutions.

(ii) **More effective generation of demand.** It has been noted in the literature that, in developing countries, the output of development programmes cannot just

be 'marketed', since the needs are not clear and demand has to be generated (Paul, 1982). Even in a highly literate state like Kerala, it was necessary to generate demand for safe water and sanitation, as we have seen. Participation facilitates this demand generation. Changes in health habits are difficult to bring about, especially if they are rooted in traditional beliefs. When community members are themselves actively involved in the demand generation, the messages are likely to have more credibility than in the (more common) process of handing down knowledge in the form of programmes for 'educating the community'. Trainers drawn from among the community members are more likely to understand the point of view of the recipients; they may also be able to communicate more effectively in a language more readily understood by the people. If local grassroots institutions such as youth and women's organisations are involved, participation is facilitated. The results of community involvement in Project I are reflected in the better usage of the project source and the better awareness of the implications of not using safe water on the part of community members.

Project I ensured that the health education was completed before the facilities became operational. As regards sanitation, unless the selected beneficiaries attended a minimum number of sessions on health education, they were not given the latrines. These steps ensured that the beneficiaries saw the project as one leading to improvement in health.

Implications. Generation of demand is crucial, and it pays to deliver the messages through community members themselves (after suitable training). This should be done before the actual facilities become operational.

(iii) **Greater responsiveness by the bureaucracy.** It has been claimed by believers in the greater responsiveness hypothesis (Echeverri-Gent, 1992) that participatory projects are likely to reflect the needs of the poor and to be more responsive to their problems and concerns. When exit is not an attractive option (as is the case with rural water supply projects), voice could be an alternative (Paul, 1991). Participatory institutions make it more likely that the voices are heard.

The opposite point of view, the elite dominance hypothesis (Echeverri-Gent, 1992) holds that the entrenched elite are too powerful to be displaced, and CP becomes one more vehicle for their domination. The bureaucracy is seen as guarding its own interests rather than those of the community at large; it is in fact seen as a part of the dominant elite. Another reason for non-response by the bureaucracy noted in the literature is that the systems of incentives in bureaucracies are not geared to respond to the needs of the community (Ostrom et al., 1993). The rewards for the staff tend to depend more on pleasing their superiors than on serving the interests of the community.

Our study seems to support the greater responsiveness hypothesis. Local institutions can effectively pressurise the bureaucracy to respond, and institutions such as WWCs, with a representation from a broad cross-section of society, can put pressure on local institutions which, in turn, can put pressure on the bureaucracy. Systematic documentation and follow-up by community members are vital for exerting this pressure on a sustained basis, and participation helps in these. Conversely, without such pressure, bureaucracies may tend to be less responsive (as is seen from Project II's experience with the KWA regarding maintenance of standpipes).

Implications. It is possible to design institutional mechanisms that could exert pressure on bureaucracies to perform. This pressure may not come merely through elected representatives; more broad-based community organisations may be required. These need to be supported, however, by local democratic institutions which can play an important role in making the bureaucracy perform, and by committed professional bodies such as SEUs which could offer advice.

(iv) **Sustainability through feeling of ownership.** It has been argued that participation may lead to increased commitment to the project on the part of beneficiaries, and this commitment can be an intermediate variable which contributes to the overall effectiveness of the project (Finsterbusch and Van Wicklin, 1987). This argument is supported by the study. The much higher degree of beneficiary involvement in the various stages of Project I and their continued involvement seem to have had a bearing on the cleanliness of the standpipes and the greater willingness to take initiatives to keep the taps working and to exert pressure on the bureaucracy.

The experience in the two projects with regard to cost recovery shows that a higher cost recovery may be feasible in projects which deliver better results and where beneficiaries continue to be involved after the construction phase is over. Cost recovery seems to enhance the commitment of beneficiaries and their sense of ownership, but this may well not happen if the project is poor in its delivery (for example, the household connections in Project II), when it could lead to a greater degree of dissatisfaction.

Implications. It is important to build a feeling of ownership in the community members. This can be done through effective communication, genuine involvement of the community members in decisions (where they can see that their voices are heard and make a difference) and community-based mechanisms which encourage local initiatives and continued participation. Cost recovery could enhance the feeling of ownership, if the project delivers according to expectations.

(v) **Better designs through local knowledge.** Another way in which participation could lead to better outcomes is through the use of local knowledge which could lead to better designs and systems of operation and maintenance (Paul, 1987; Finsterbusch and Van Wicklin, 1987). When projects are implemented by large bureaucracies, however, the standard operating procedures may make it difficult to imbibe local knowledge. More important, officials may have little incentive to learn and use local knowledge (Ostrom et al., 1993).

Our study shows that even large bureaucracies could make useful adaptations in designs based on local knowledge, if there were intermediary agencies that put pressure on them to do so. This agrees with the findings of another study on community participation in the state of Karnataka in India where a number of modifications were made to washing slabs, drainage etc. based on feedback from the community (Manikutty, 1995b). Project I adapted the designs of standpipe locations and the surrounding drainage to suit local conditions based on inputs from local community members. SEUs and local *panchayats*, charged with the responsibility of implementing the sanitation programme, also tried out different designs of latrines to suit local conditions (such as making use of locally available materials and in solving the drainage problems in some areas, especially in coastal areas). Local women masons were trained and this enlarged the scope of participation and made suggestions from them more likely. New alternatives were generated when the established customs were seen as hard to change, such as the chlorination of wells, for example, and care was taken to include the community in this effort.

The pessimism expressed by Ostrom et al. (1993) regarding the poor chances of bureaucracies institutionalising the absorption of local knowledge seem to be well justified, however. Despite the encouraging results in Project I as a result of CP, little of this learning was transferred to Project II, or, it seems, to later KWA projects.

Implications. Project designs need to be made flexible enough to enable modifications to be made based on local knowledge gathered and experience gained as the project progresses. However, effective absorption of this local knowledge requires a willingness on the part of the implementing agency to adopt what Korten calls a 'participatory learning approach' (Korten, 1980). Institutions such as SEUs, with some ability to influence decisions, seems to be almost essential. It appears very unlikely that bureaucracies, on their own, will adopt a participatory learning approach and be willing to absorb local knowledge effectively.

Limitations of the study and issues for further research

We recognise that the lessons of this study, undertaken in the state of Kerala where literacy and political awareness are high and the general state of health is much better than in most other Indian states and is in fact comparable to that of developed countries, and where strong local institutions exist, may not be immediately transferable to other situations or countries. Kerala has a set-up that is far from the feudalistic society prevalent in many parts of the developing world, and hence the ability of its local committees and institutions to prevent elite domination may not be replicable in other areas. An interesting issue for further research would be the elaboration of the adaptations to the Kerala model required to suit different social conditions.

Another question that has not been addressed in this study is what the conditions that lead to greater project effectiveness are, given community participation of differing kinds and degrees. This needs a comparative study of projects involving CP in different forms, which will enable the appropriate design of projects to make full use of CP as a vehicle for greater effectiveness.

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Fishing and Farming in Lake Chad: Implications for Fisheries Development

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In the history of fisheries development worldwide, 1982 was a turning point, with the 200-mile economic exclusion zones set up by the UN Conference on the Law of the Sea providing the basis for the coastal nations of the South to manage and develop their marine fisheries, and the World Bank's review of the failures of earlier investments and proposal of a new strategy for future development (see Table 1 and Sfier-Younis and Donaldson, 1982; World Bank, 1984). However, in the 1990s the failures were still at the forefront of the debate and fundamental choices in the ethics and politics of fisheries development were called for (Bailey and Jentoft, 1990).

For much of the post-World War II era, the fundamental debate has concerned the trade-off between technical advances in methods for catching fish and the sustainability of fish populations. Attempts to overcome perceived technical constraints by providing fishing equipment on credit were followed by investments in stock management and training. These were accompanied by concern to remedy the 'tragedy' of open access fisheries. Small-scale artisanal fishers are a recent focus of attention and many hopes currently centre on the potential for aquaculture development. Despite changing opinions, the debate has only rarely strayed inland where fish production can make an important contribution to regional diets.¹ Although pleas have been made for recognition of the special characteristics of fishery resources, policy recommendations devote minimal attention to the fisher-farmers of inland fisheries.

This article examines the rural economy of the extreme north-east of Nigeria and the implications of the results of socio-economic research in fishing villages

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1. For example, in Nigeria (the most populous country in Africa) domestic freshwater fish production provided an average of 30% of national fish consumption in the early 1970s (FAO, 1978).