

DRAFT

ENVIRONMENTAL AND SANITARY ENGINEERING PROJECT

KANPUR - MIRZAPUR
UNDER GANGA ACTION PLAN

TOWARDS ENVIRONMENTAL SANITATION

AN APPROACH PAPER ON COMMUNITY PARTICIPATION
AND HEALTH PROMOTION ASPECTS

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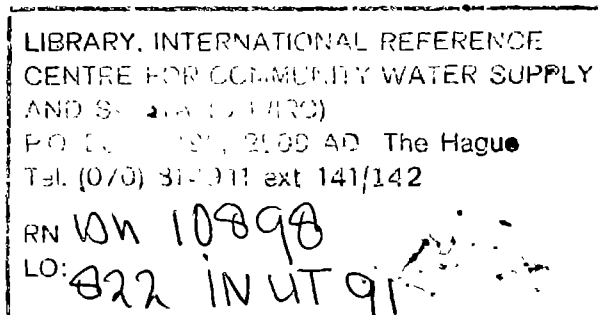
IRAMCONSULT
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COMMUNITY PARTICIPATION AND HEALTH PROMOTION ASPECTS

1. INTRODUCTION

The programme on community participation and health promotion is being carried out by the two municipalities of Kanpur and Mirzapur with support of Indo-Dutch project staff. The activities have been formulated in the respective detailed project reports, DPRs, and their subsequent modifications.

Three entries can be distinguished in the programme. The first set of activities are related to aspects of health, water and sanitation and provide support to sanitary interventions in the living environment. The focus is on environmental sanitation aspects in especially the slum areas. The second component is concerned with skill training and aims at the entry of women in the more skilled jobs available through sanitary construction work. The third component is focussed on improvements in the work environment. During its first stage, occupational health programmes for tannery workers in Jajmau and carpet weavers in Mirzapur were taken up. The second stage is concerned with an intervention programme for these two industries. For the tanneries it has evolved into an industrial counselling programme, while for the carpet industry it has taken the direction of a development programme for the weaver communities. The focus remains however on improved environmental and sanitary conditions. The first steps have been taken to expand the programme to the sweepers, a professional category directly involved in sanitary work.



2. ENVIRONMENTAL SANITATION

2.1 Approach and Methodology

The overall objectives of environmental sanitation improvements can be formulated as :

- a. to achieve sustained improvements in environmental health conditions,
- b. to ensure effective utilization of the facilities being provided,
- c. replicability of the approach and methodology being followed*.

The latter aspect refers to the cost effectiveness of the interventions and its supporting infrastructure. Since the project is concerned with environmental protection and improvement of the living conditions, the following specific objectives have been formulated:

- To ensure that improvement activities carried out by the project will receive priority attention in residential areas which are poverty stricken and have the lowest level access to sanitary facilities.
- To facilitate community participation and involvement in planning, implementation, operation and maintenance of the different technical project components with a special focus on the role and position of women.
- To ensure that the sanitary interventions, as well as the already existing and remaining facilities in this field are beneficial to public health.
- To ensure that the implementation of the improvement programme reflects the identified needs, perceptions and attitudes of different categories of the population (e.g. income levels, caste, class, community and gender).

As mentioned above, community participation and health promotion are most prominent in aspects related to the improvement of living conditions in the low income residential areas.

In the project therefore the main focus in community participation and health promotion is on water supply improvements, solid waste collection and disposal and sanitation. Especially for these components an active involvement and support of the communities is required to make the interventions successful and its impact sustainable.

At this point it should be noted that the relation between technical distribution systems and the community always implies a mutual influence and adjustment. Although inter-relationships are obvious we can formulate a number of practical examples which are summarized below:

Water Supply:	affordability; willingness to pay; operation and maintenance of community standposts or handpumps; water spillage; location; drainage; hygienic practices.
Sanitation:	awareness; affordability; willingness to pay; operation and maintenance (private and public); location; health related knowledge, attitudes and practices.
Solid Waste: Collection and Disposal	awareness; dumping practices; location of facilities; health related knowledge, attitude and practices; affordability.

For the operationalization of the concept of community participation, an approach has been developed which aims at the involvement of different categories of "health agents" or "facilitators" at community level in realizing above mentioned objectives. The health agents identified, comprise both the formal and informal sectors and consist of the following categories:

1. Traditional birth attendants
2. Private medical practitioners
3. Primary school teachers
4. Anganwadi workers
5. Community volunteers
6. Handpump users representatives.

The process adopted in facilitating their participation and through them, to seek the active involvement of the concerned communities, is described below:

2.2 Establishment of an Interface and Community Networking

For sustained improvements of environmental health conditions, an interface is required between on one hand the communities and especially the slum population and on the other hand, the different government agencies which have to provide the services and facilities.

For Jajmau, Kanpur and Mirzapur a system is being followed of community workers from the respective municipalities who interact with the different facilitators at community level. Through a process of selecting facilitators, conducting orientation programmes for each specific category and organising refresher/follow-up programmes, networks have been established which comprise more than 500 persons each in Jajmau and Mirzapur. They are being mobilized to ensure sustained improvements in the project areas. The community centre acts as interface between the different layers and fulfills the following functions:

- to monitor the performance of the "facilitators" at community level.
- to assess the effective utilization of services and facilities

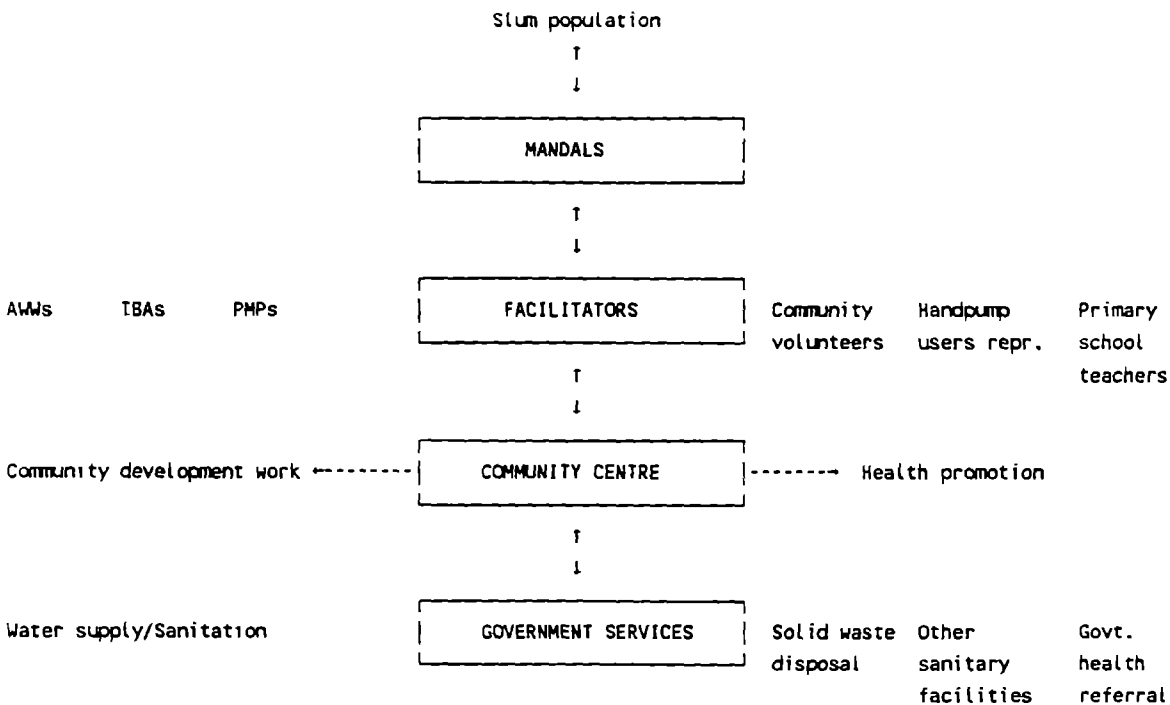
being provided by different government agencies.

- to establish interlinkages and provide the feedback between the target groups and the responsible government officers through a system of follow-up programmes in which all concerned parties participate and exchange their views and experiences.

In itself, the scope of work of this interface needs not to be confined only to the promotion of better environmental and sanitary conditions. With the addition of health extension workers it could play a role as well in improving the basic health services adopting the same approach and methodology.

To facilitate an effective communication with the target population, the establishment of community level organizations is being promoted. The community level organizations or Mandals are slum based organizations which do bring together the different facilitators. The officer responsible within the Municipality for community development works is the ex-officio member of each mandal.

The organogram presented below gives an overview of the different interrelationships.



2.3. Community Level Training

As a first opening towards "facilitators" at community level, orientation courses were planned for each category. The process was as follows:

2.3.1 The Preliminary Surveys and Inventories

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In order to make the training courses as appropriate as possible, questionnaires were developed for interviewing TBAs, Primary School Teachers and Private Medical Practitioners and Community Volunteers, including handpump users representatives. To find out who they were and what they were doing.

Private Medical Practitioners:

The importance of Private Medical Practitioners was confirmed by the diarrhoea survey, during which parents reported that these people always treat their children. The surveys of PMPs in Kanpur and Mirzapur showed the wide variety of training and background which they had, and the number with no relevant qualifications at all. It also picked up problems which had not been anticipated in the initial course outlines, such as the over-use/mis-use of I.V. drips and antibiotics for children with diarrhoea.

Traditional Birth Attendants:

The two surveys of TBAs revealed a great deal about their practices, which allowed the training programme to be modified and made more appropriate.

Inventories were also made of possible referral points for the TBAs who find problems with a pregnant or delivering mother. In Jajmau this led to a good link being made with the ESI Hospital which acted as host for the second batch of training and other referral institutes. In Mirzapur, links were established with the District Hospital and the Ayurvedic Nurse Midwife Training Centre (ANMTC).

School Teachers:

The survey of Primary Schools confirmed what had been suspected, that there were many very small schools in each project area with very few sanitary facilities.

Community Volunteers:

The inventory of community volunteers was confined to areas where substantive inputs from the project do or will take place soon. It includes the sanitation areas (private and public), the solid waste demonstration areas, basties with substantial handpump installation and the areas selected for the diarrhoea study. In most of these areas immunization campaigns were held as well. Above mentioned areas are not exclusive but often combine one or more interventions.

The inventory of community volunteers was directed towards individuals with whom contacts were established before and showed interest to support the different activities that took place (local informal leadership, organizers of immunization camps, etc.). Data were collected on their background, past involvements in community work and future willingness to contribute. Separate inventories were made for men and women.

The inventory served as the basis for the design of the course modules for the separate orientation programmes for male and female volunteers.

Handpump users representatives:

A separate category of community volunteers is formed by the handpump users representatives. They are persons, mostly couples of husband and wife, who are willing and motivated to take responsibility for operation and maintenance of the handpump in the vicinity of their house.

With expansion of the handpump installation programme to all water scarcity areas, they form a substantive proportion of the network of facilitators.

Anganwadi Workers:

The project was involved in initiating the ICDS at Jajmau, Kanpur. Since the structure and objectives of this programme is known no inventory or survey was required. Presently 35 centres have been established. Mirzapur has not been covered yet under this scheme.

Survey of institutes to provide training support:

The project has a policy of working with and strengthening local institutions, so the Departments of PSM in Kanpur Medical College and Banaras Hindu University were involved in finalizing course outlines and lesson plans. All programmes were executed by the municipalities itself with support of project staff. Course coordinators and facilitators were drawn from the municipalities and different institutes and agencies.

2.3.2 The Training Courses**Traditional Birth Attendants:**

About 60 TBAs each were trained in Kanpur and Mirzapur. Good resource people were found in both places and the teaching methodology included a lot of role-plays and songs, which worked well. All groups were able to visit the referral facilities. There was positive feedback from TBAs, resource people, and observers about the course.

The TBA course has been designed following a two-pronged approach. To improve their MCH practices and to motivate them to conduct health promotion activities in their respective areas.

Anganwadi Workers:

Anganwadi Workers are a part of the Integrated Child Development Scheme. They are supposed to run a creche in their respective slum areas in the mornings for under-fives, with nutritional supplements for malnourished toddlers and pregnant women. In the afternoon they should make home visits and provide health education to mothers. Their task is big and their training and experience inadequate. In Jajmau, Anganwadi workers were given two days of training. The course discussed the interlinkages between project objectives and tasks of the Anganwadi workers. They were briefed about the technical interventions being

planned and the possible support that could be provided by the anganwadi workers towards the aim of better environmental and sanitary conditions.

The first course went well, but afterwards it was felt that there was insufficient translation into action. The Anganwadi workers are handicapped by all kinds of fundamental problems (poor accommodation, insufficient supervision) and are somewhat daunted by the size of the task they are supposed to tackle. During the follow-up course it was agreed with them that they would participate in project activities, starting with the diarrhoea survey and the organization of community volunteers. This would get them out of the Anganwadi Centres and into touch with mothers, giving them the experience they need to undertake their other tasks.

Private Medical Practitioners:

PMPs welcomed the opportunity of having their skills updated and being accepted as colleagues by important members of the city's medical profession. However some did not attend the first day for fear that their qualifications would be checked. Attendance on the second day was much better. The course focussed on diarrhoea management for its relevance to project objectives and outcome of the inventories. Several requests were made by PMPs to provide courses as well on topics as skin diseases and TB.

About 70 PMPs in Kanpur and Mirzapur did participate in the orientation courses as per date.

Primary School Teachers:

Four groups of Primary School Teachers , totalling about 80 teachers, were trained in both Kanpur and Mirzapur. The course content and the UNICEF educational materials were well taken, and some schools say they have used them in their teaching to the children. Some constraints have affected the extent to which the course content has been used:

- Almost all schools, particularly the municipality schools, have no latrines, hand washing facilities and rubbish bins for use by the children. Thus the most obvious way of teaching, through the supervision of good practices, is denied to them.
- School timetables and curricula are very tight and do not allow for much introduction of new subjects: teachers were not enthusiastic about activities which would involve much extra work, such as melas or competitions. What they said was that Saturday afternoons were flexible and usually the whole school then gathered together. This was one of few occasions when they could introduce the subject-matter.

Community Volunteers:

Four training programmes for community volunteers (women and men) were organized in Kanpur and Mirzapur. In total about 80 volunteers did

participate in both the two project areas.

The objectives of the programmes are that the community volunteers should be able to discuss, promote and organize within their communities the following:

- Improved environmental sanitation
- Better water-use and sanitation practices
- The need for proper care and maintenance of facilities
- Preparation of ORS and better diarrhoea management practices
- Immunization
- Establishment of community level organizations (Mandals)

The course aimed at community volunteers to be the channels of communication with the basti people. The training programme was conducted by staff of the municipalities with support of project staff and for Kanpur by the College of Nursing at KMC. Concerned technical officers of the executing agencies participated in the discussions on specific interventions, which resulted in lively discussions and exchange of opinions.

In Kanpur, role plays were prepared by the Anganwadi workers (ICDS) on focal themes such as water use/water storage, proper excreta disposal, sanitary use of latrines, personal hygiene, proper use of handpump, and proper solid waste disposal. For Mirzapur a local group of musicians prepared songs on these aspects, while municipality staff conducted role plays.

Handpump users representatives:

More than 300 persons each in Kanpur and Mirzapur have been involved in the courses conducted for handpump users representatives. Towards course contents and conduction of courses, support has been provided by Unicef Office, Lucknow. Resource persons are drawn from the water works departments.

The objectives of the course are that after its completion the participants are able and motivated to do the following:

1. To fill in and submit the complaint card to the water works department in case of breakdown or other defaults.
2. To keep the platform and its surroundings clean.
3. To promote better environmental and sanitary conditions in their respective areas.

2.3.3 Follow-up Programmes

A change in knowledge, attitudes and practices is not an overnight affair which can be achieved through one single orientation course. On regular intervals therefore, an assessment is made to what extent the objectives are being achieved, what the bottlenecks and constraints are and in what ways their performance can be improved. Based on the findings, follow-up programmes/refresher courses are being organized which address these issues. Examples of the regular assessments being

made are the status reports which are being prepared for the handpump- and private latrine construction programmes.

The aim of the follow-up programmes is to establish a framework for institutional development. The networking with community level change agents is an important aspect thereby, but of equal importance is the process of institutional strengthening of community level organisations and to create the conditions at local government level to provide the services they are supposed to give. For the t.b.a.'s it was observed that although their practices did improve, the referral support being provided by different health agencies was weak. Since it tends to be frustrating for trainees when they try to do what they have learnt and are being faced with this constraint, it was decided to pay attention to this aspect as well. As part of the follow-up programmes the t.b.a.'s have been motivated to form societies to ensure better referral support.

For the primary schools involved in the programme a school sanitation programme was initiated. On a demonstration basis, basic sanitary facilities are being provided to municipality schools in the two project areas. At the same time, promotion activities such as poster making competitions on water-and sanitation aspects continued.

For operation and maintenance of handpumps, the network of handpump users representatives has become too extensive to maintain a regular contact. A stratification was established of sub-zonal and zonal representatives to streamline the communication lines. Through a process of training of trainers the direct involvement of community workers of the municipalities has been reduced. To facilitate the timely and adequate repair of handpump the performance of the maintenance crew was assessed as well and additional training provided. For providing adequate back-up services registers are maintained of the spared parts required and the costs involved in regular operation and maintenance of handpumps.

A later addition to the programme has been to make the handpump users representatives responsible as well for regular chlorination of the wells in their vicinity.

A water testing laboratory is being set up at the water works department for regular water quality control.

2.4 Supporting Services

The interface being established in the two project areas is not confined to aspects like providing a building, nomination of permanent staff and office equipment. The community centre has to be provided with the financial scope as well, to make its contribution to sustainable improvements. It has to carry out its programme of regular follow-up to and interaction with community level organizations and change agents. In addition, experiments are being conducted to provide other supporting services through this interface.

The entries being explored are the distribution of different types of



slum specific promotion materials, the establishment of a water quality testing laboratory and the production of Primary Health Care Packets.

2.4.1 Slum Specific Promotion Materials

An extensive inventory of existing promotion materials on health, water and sanitation aspects was made at an early stage of the project. Although valuable materials are available on different topics, the overall conclusion was that most of the materials have been developed for use in rural areas. This conclusion was shared with Unicef and it was decided to make a joint effort to develop urban and slum specific promotion materials. Priority was given to the development of the following promotion materials.

1. Flip cards
2. Leaflets
3. Promotion video's

ad 1. Flip cards

The flip cards contain the key messages on health, water and sanitation. They cover the following aspects.

- River pollution
- Solid waste
- Sanitation
- Safe water practices
- Personal hygiene and diarrhoeal management
- Preparation of home made oral rehydration solution (ORS)

The flip cards are being distributed to facilitators at community level (community volunteers, anganwadi teachers, etc.) for dissemination of the messages. Monitoring of their use and impact is provided by the municipalities and the project.

ad 2. Leaflets

Leaflets were developed on:

- Sanitation
- Solid waste
- Handpumps
- Piped water supply

who can read?

The leaflets have been designed for wider distribution and provide information on planned sanitary improvements and what communities can contribute to improve their own living conditions.

ad 3. Video films

Video films were prepared on:

- skill training (masonry) for female construction workers
- traditional birth attendants.

The purpose of the video films is to promote the idea of upgrading skills at decision making levels. The first video promotes the concept of involving women in sanitary works at higher skill levels through providing training to them. The video on the traditional birth attendants addresses the issue of better mother and child care to be provided by them, as well as involving them in the promotion of environmental sanitation. It starts from the premises that they form the first line of MCH care in especially slum areas. Rather than to ignore this fact, it has to be accepted it is the prevailing situation and that much can be done to improve their practices.

Other Promotion Materials

For specific project interventions, such as the installation of handpumps and the construction of private latrines, brochures have been prepared which contain construction specifications. It enables the facilitators at community level, to closely monitor the quality of work. At individual handpump sites, sign boards have been placed which contain the main promotion messages regarding water practices and proper O&M of the handpump.

For promotion activities, in addition and depending on the subject, materials are being used from other sources.

2.4.2 Establishment of a Laboratory for Water Quality Testing

At Mirzapur no adequate facilities were found to be available for water quality testing. Therefore, through the water works department of the municipality a laboratory has been established to provide this service.

Handpump users representatives have been trained in the collection of water samples from sources as wells and handpumps and bringing them to the laboratory for testing. The system implies that the laboratory is integrated with the effort to establish a safe drinking water supply system and provides the back-up support to the network of water users representatives.

2.4.3 Production of Primary Health Care Packets

The deptt. of preventive and social medicine at Banares Hindu University has developed a range of low-cost primary health care packets. The programme carried out in Kanpur and Mirzapur has created an increasing demand with traditional birth attendants for delivery kits. the demand for ORS packets has sharply increased as well. Since the supply lines are too long to meet this increased demand, production has been taken up at Jajmau itself a the community centre. Preparation of the packets is done by local volunteers who receive a small remuneration through distribution of the packets

2.4.4 Additional Activities

During the inception phase of the project, a community survey was

conducted to assess the priorities in the project areas. It was found that although sanitary improvements and especially water supply, do rank amongst the highest priorities with communities, other interventions were considered to be essential as well. The outcome of the priority assessment varies per case but it was clear that in the lowest income brackets, employment and income generation were considered to be the only priority. During group discussion this priority was established to the extent that sanitary interventions and a change in water and sanitation practices, could only be discussed in relation to their poverty. No specific category can be singled out, but it was found that especially female headed households do need special attention in this respect.

It became therefore evident that in order to arrive at more permanent improvement in living conditions, additional income generating activities especially for female headed households are prerequisite. In addition, the sanitary interventions would affect the employment position of scavengers and ragpickers. The replacement of dry latrines by flush latrines would abolish the practice of collection of night-soil by scavengers, while the introduction of hygienic solid waste collection practices, if correct, will certainly affect the position of the ragpickers. For above mentioned reasons, support was therefore provided in formulation of a separate scheme on income generating activities for women.

The scheme will be executed by the Self Employed Women's Association (SEWA). The second priority was identified during the course of promoting better health care related to water and sanitation practices. The project is for its scope not in the position to provide referral support to the health agents in the two project areas (PMPs and TBAs). The project is not in the position either to establish an effective urban health care system in the two project areas. Therefore, support was provided in the formulation of an Urban Health Care Scheme in the two project areas. The project has been taken up by Memisa Medicus Mundi, a Dutch n.g.o. which specializes in funding health care projects in third world countries. The project holder is Benaras Hindu University which executes the project in collaboration with the Kanpur Medical College and the Voluntary Health Association of India (VHAI).

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3. Women's Involvement in Improving Environmental and Sanitary Conditions

3.1 Outline

It is widely accepted that environmental and sanitary improvements require a gender specific approach. Women are more affected by poor sanitary facilities than men, either directly or indirectly through their children. When children have no option other than to play in slum areas with polluted and stagnant drains and waste lying around, the mothers are to be mobilized first when sanitary interventions are possible and community support towards a change in knowledge, attitudes and practices (KAP) is required. When no latrine facilities are available, women have to go into the open field before dawn or after sunset for defecation. They will be generally more motivated than men to opt for sanitary latrines, especially under congested urban conditions. When water collection and storage practices need to be improved, women play a major role since they collect the water most of the time. In our case it was found that women collect the water in 74 percent of the cases.

For effective interventions the active involvement and support of women is required. In summarizing the experiences gained with the UN Water and Sanitation Decade, it was concluded that only through active involvement of women sustainable improvements in sanitary conditions could be realized.

Although women's involvement is accepted as a concept, less clarity exists on the approach and methodology to be followed in ensuring their involvement. For the wide divergency in socio-economic and cultural factors, it is not possible to reach a consensus on one single and uniform approach. At the same line, the literature available on this topic, suggests that a better and more profound exchange of views and experiences on operationalization of the concept is needed. At least, we found it difficult to find concrete suggestions on how women's involvement should be concretized. We went through a process of trial and error and thought it relevant to share our experiences with others who are to face similar processes questions. We discuss the different aspects of their involvement below.

3.2 Women for women

The heading indicates that in order to involve women, the most effective entry is to approach them through women. It sounds logical and simple but in many development areas in which women's involvement is crucial, it is not applied. In U.P, for instance marginal farm households supplement their income often by off farm employment in which men migrate to other places to find work. The result is that most of the agricultural work is being done by women. Still the agricultural extension workers are almost exclusively male.

confidence of women for their access to for men confined enclosures. The first step therefore in starting a water and sanitation project is to employ female staff at all levels. Not only as field workers but of senior staff levels as well. We opted for mixed teams of men and women at all levels. Not all activities are gender specific, while it is important as well to mobilize men for change.

Through involving women at all staff levels, it was possible to establish good contacts with active women at slum level and to mobilize them for initiating change.

3.3 Mobilization for Environmental Sanitation

The project has a mandate for supporting the local governments in improving environmental and sanitary conditions in the urban areas of Kanpur and Mirzapur. The change in sanitary practices is related to technical interventions which are community based. Under community based are understood those schemes which have a direct impact on sanitary conditions in the living environment and which would require a simultaneous change in sanitary practices. It concerns the improvement of the water supply system, solid waste collection and disposal and sanitation.

To ensure community involvement in the planning, execution and O&M of these schemes, as well as a change in water and sanitation practices, an indirect approach has been adopted by the project. Use is being made of intermediate levels of change agents at community level. It concerns the following categories.

1. handpump users representatives
2. community volunteers
3. traditional birth attendants
4. Anganwadi workers (Kanpur only)
5. Primary School Teachers
6. Private medical practitioners

Of these different categories, the traditional birth attendant and the anganwadi workers are exclusively female. The handpump users representatives, community volunteers and primary school teachers are each for about 50 percent female. The private medical practitioners on the other hand are almost exclusively male.

Through these intermediate change agents, women are mobilized. Involvement of women covers the following aspects.

- Site selection of sanitary facilities (especially the roadside bins and handpumps)
- quality control during execution
- community management of facilities
- improved water and sanitation practices
- promotion and acceptance of better sanitary facilities

Although women's involvement at community level has been ensured, a limiting factor remains their involvement in activities beyond their own community. A large network of (semi-) volunteers which contributes to the programmes, needs coordinating levels. Especially for muslim women it remains a constraint to seek an active involvement outside their own areas. It is not only culturally determined but relates to

the time factor as well. They can only devote part of their time to voluntary work.

The result is a situation in which men have a more dominating role in coordination of community action. The possibilities to overcome it are investment in women in terms of human resources development and to explore the scope for (semi-) paid voluntary work. Paid work legitimizes women to operate in a wider environment. Anganwadi workers, traditional birth attendants and teachers are typical examples.

3.4 Skill Training

In construction work it is common that women are involved in low paid and unskilled work. At each construction site women can be seen at work. In the building industry it concerns often gangs of migrant labourers which build their temporary accommodation at the site itself by making use of available materials. Since women play an important role in improving environmental and sanitary conditions, it was felt that efforts should be made to increase their share in construction work being taken up under the Ganga Action Plan. When the first construction activities started under the project, the common pattern was confirmed that the involvement of women was confined to the unskilled, lower paid and more tiring work such as earthwork, carrying of materials and breaking of stones. As soon as more skilled work was taken up like masonry work, no women could be found on the site anymore.

As per date we found two suitable entries to upgrade their skills. It concerns the training of women as masons and fitters. The main focus in masonry training has been on the construction of sanitary latrines. It would make it possible to involve them in this component being taken up under the Ganga Action Plan, while after the completion of the scheme sufficient possibilities would exist to continue as masons. Not only by installation of latrines in other areas, but through diversification of skills in other types of masonry work as well. Two batches of women consisting of 15 women each have been trained at Kanpur and Mirzapur. In Kanpur recently the training as female fitters was started for a group of 15 trainees. Their sustained employment is guaranteed through involving them as maintenance crew for the piped water supply system and handpumps. Training takes place on the rehabilitation works for the piped water supply system being taken up under the Ganga Action Plan, while through installation of water tax meters and the subsequent revenue collection, enough financial scope exists for their continuation as maintenance crew for the local water works department.

Without entering into the specifics of the training programmes, we would like to discuss the special features and the wider implications of this programme below. The quotations are from interviews conducted for a video film which has been made in collaboration with Unicef on the masonry training programme for women.

Empowerment

Identification and selection of women for the first batch of training as masons, was difficult. It was overcome by approaching female construction workers who were found to be receptive to the idea of skill upgrading. The selection had to be confined to those areas

showing a concentration of construction workers and in which through other project interventions, a good rapport was established. Being from the same area, it enabled the women to extent each other support. After the group of trainees had been selected a series of group meetings took place to build up their confidence and to prepare them for the training. An important element thereby was that the illiterates among them, had to acquire basic literacy skills first.

'Meetings were held many times and it was felt that if a man can be a raj mistry then why can't women too become raj mistry. So we all decided to undergo the training'.

'I knew how to read and write. But there were many women who did not know how to read and write. Some learnt to read from their children and some from their husbands and those who did not know at all used to come to their friends during the meetings. There they were given slates and their colleagues taught them how to read and write so much so that they started reading an inch tape. Now all of them know how to read and write and measure a tape too'. (extract from an interview for a video film)

It is not so that the selected female construction workers never had the ambition to become a mason (raj mistry). It would be a natural development within the context of the informal sector that on a young age a person starts as labourer and gradually upgrades his/her skills to become a skilled worker. The sheer fact however of being a woman results in a situation that they remain what they are.

'Earlier on, the raj mistry never used to give us a chance to become a raj mistry. We used to give either brick and mortar to them. If by chance we handled their tools, we were scolded and were told that we could not become raj mistry. This attitude of theirs used to hurt us. Moreover, we also did not have any masons tools'. (Extract from an interview for a video film).

Although involving women as masons in construction work met with initial reservations with the local male population, these were easily overcome by the demonstration of their skills. By showing that women can do an equal good job or do even better in sectors which are traditionally reserved for men, is the most convincing factor which facilitates their acceptance.

'In the beginning people used to have reservations about our doing this sort of a job. But now, since they have come to know what all this training is about and that we can also capably handle this job they now keep silent. Earlier they used to laugh at us and say how can a woman become a mason? Now those very people say with respect-look the raj mistry is coming, where once only men were mistries now women too have become mistries. The construction site at which we are working presently there also, people come and watch us do masons job. They tell us that what we are doing is a novel thing and that we have secured for ourselves a golden opportunity that most women cannot get'. (extract from an interview for a video film)

After the first hurdle of the first batch of skill training was taken, it was found to be much easier to select women for successive batches. The demonstration effect of the first batch resulted in a situation in which women themselves started to apply for opportunities to undergo

training.

Another positive development was that especially in Kanpur the local government took interest in this type of training programmes. For the first batch of training of masons Sulabh International was partially involved as resource agency. For the successive batches use could be made of local expertise available with the concerned local agencies. The training of fitters at Kanpur was taken up on initiative of the local agencies as well.

Acceptance of women as skilled workers

After completion of the training, the masons formed societies in order to receive independent assignments from the local agencies responsible for the sanitation component of the project.

In Kanpur, after overcoming the initial administrative bottlenecks, a system was established in which the two societies of masons started to receive regular assignments. Mirzapur shows a different picture altogether. The authority responsible for sanitation work was found to be reluctant to provide regular assignments and issued work orders piecemeal wise only. It is difficult to identify the reasons for it since the arguments given for not providing work vary over the time. When one bottleneck is removed then the next objection is raised. Let's discuss them as per the time sequence.

The first objection raised was that the masons did not answer the quality standards of skilled (male) masons. By completing their first assignment successfully and by showing they did on an average a better job than their male colleagues, this argument was no longer valid. The next objection was that the local agency could only involve societies that were approved and had received a government order from the State Government. A government order implies that the concerned society is entitled to a fifty percent advance on construction work. For new entries to this construction field, especially a local society such as the ones formed at Kanpur and Mirzapur, it is impossible to get a similar sanction of the State Government. The procedure is too elaborate for them. With support of the Ganga Project Directorate this hurdle was overcome as well. Even the question of having sufficient working capital to take up work independently was finally solved, when the agency took the decision to start the work departmentally. The progress and quality of work shown by contractors and approved societies was that dismal, that the agency decided to take up the work directly through involving petty masons on daily wages. When this decision was taken it was thought that the problems would be over, but not so. Only two female masons were enrolled.

For the other female masons it was thought that the speed of work did not justify the payment of Rs.50/- per day. There is some justification for this argument since through prolonged periods of unemployment, most women lost their routine. The suggestion offered that initially at least they could receive a lower wage till the time they would have built up their routine again was not accepted either since it would be against administrative rules.

It is not so that for the full period after completion of the training the female masons have been unemployed. They were involved in other construction works (platforms for handpumps, construction of a drain,

etc) but with prolonged gaps in between. Besides, it is still expected that they will be employed gainfully finally on the sanitation scheme. The bottlenecks described above, indicate however what possible constraints may be expected.

It is an intriguing question why similar constraints did not occur, at least to that extent at Kanpur. There are two possible explanations. First of all at Kanpur the municipality is responsible for execution of the sanitation programme. Having been responsible as well for conducting the training programme, more responsibility is felt for the trained female masons. The positive experience has resulted in a desire with the municipality to take up more skill training programmes for women of a similar nature. Although an important aspect, the decisive factor in Kanpur has been a work culture with the local government which reflects its status as a metropolitan city. The municipality of Kanpur is more open and receptive to new and innovative ideas than that of a small town as Mirzapur. Getting things done prevails over red tape.

Sustainability

The Mirzapur experience shows that sustainability of the programme is not guaranteed beforehand. We do not take lightly therefore the scope for sustained employment after completion of the project. For masonry work diversification of skills is required. The best option available thereto is the link up with the building centre programme of Hudco. It provides support to local units (n.g.o's, societies, municipalities) to take up construction work by using low cost construction materials. The support consists of both financial support and training of workers. The societies formed out of female masons are going to submit an application to Hudco for the establishment of building centres at Kanpur and Mirzapur.

The sustained employment of the female fitters undergoing training at Kanpur presently, is guaranteed beforehand by involving them as maintenance crew of the water supply system after completion of the rehabilitation scheme. The difficulty here is that in order to appoint them as regular maintenance staff, they need a recognized diploma as fitter. The possibility thereto would be to follow a one year course at ITI, Kanpur. A vocational training institute which follows a different training methodology with a heavy emphasis on classroom training. We are not very enthusiastic about this type of training for several reasons. Learning by doing is a more effective training method yielding better results, has a shorter duration and fits better in the traditional system of training within the informal sector. We try to convince ITI now to endorse the training programme, which would make it possible to give the trainees a diploma. It would make the difference between employment on a daily wage and becoming regular staff and widens the scope at the same time to take up work independently.

Other options for skill training

Skill training is not necessarily confined to masonry training and training as fitters. Investments in improving environmental and sanitary conditions, or any other development work for that matter, generates additional employment. Not only in construction and establishment but through operation and maintenance as well. In Kanpur

women are responsible now for the production of low cost primary health care packets (ORS and TBA kits). From the network of intermediate change agents, community health workers have been selected which will undergo training in providing basic health care in their respective slum areas. Skill upgrading (sweepers, male masons) takes place as well but does not result in additional employment and is not confined to women only.

Whatever field is chosen, the consideration remains providing gainful and sustained employment while through this investment a contribution is made to improving the quality of life. Whenever possible preference can be given to women, but not exclusively.

4. OCCUPATIONAL HEALTH PROGRAMME

A significant proportion of the population in Jajmau, Kanpur is employed as tannery workers. In Mirzapur, the brassware and carpet industry are the main sources of employment. Therefore, any development programme in Kanpur and Mirzapur aimed at improving the living conditions, should address the needs of these professional categories as well. An occupational health programme was therefore formulated for the tannery workers in Jajmau and the carpet weavers in Mirzapur. A programme for the brass ware industry is planned to be taken up at a later stage.

It was felt that in the promotion of better environmental and sanitary conditions, the work environment is equally important as the living environment.

The long term objective of the programme is to improve the work and environmental health conditions in tanneries and looms and through these improvements would contribute as well towards a better living environment.

Short term objectives are:

1. To make a situational analysis of occupational health conditions of tannery workers and carpet weavers.
2. To formulate and execute interventions with the aim to diminish the risk of occupational health hazards.

Methodology being adopted includes the following:

1. Situational analysis, including a health and sociological survey of tannery workers and carpet weavers.
2. Formulation and implementation of interventions, based on the results of the situational analysis
3. Follow up and monitoring of the interventions.
4. Dissemination of results to various agencies active in the field of occupational health, including a workshop in collaboration with the International Labour Organization (ILO)
5. Ongoing research and publication

4.1 The Occupational Health Programme for Tannery Workers in Kanpur

The baseline survey conducted in April 1988 on community and public health aspects revealed certain important features. Firstly, the largest occupational category (42%) of heads of households in industrial slum areas were tannery workers. Thus any public health approach in the area would have to account for the environmental conditions and attitudes of these workers. Secondly, in the in-depth study on public health aspects (1987) which formed part of the baseline studies, it was found that 12% of the heads of households were suffering from categories of skin, respiratory and musculoskeletal ailments with likely occupational association. And last but not least, even casual inspection within the tanneries revealed a profusion of

environmental hazards affecting the health of workers adversely. With tanneries being the main focus of environmental pollution control measures, it was logically unavoidable to focus attention on the environment **within** the industry also and its linkage with health and general environmental issues. The interrelation of environment at the source of pollution, and its effects on its surroundings **outside** the source is a growingly interesting area of investigation with considerable practical implications.

Based on the first short term objective, the first stage in the programme consisted of a situational analysis of the occupational health situation. The situational analysis contained the following elements:

1. Occupational health survey : A detailed medical and sociological survey was conducted in 20 tanneries, selected randomly, and involved the study of 605 tannery workers and controls. This consisted of administration of medical and social questionnaires, system-wise physical examination, lung function tests and relevant investigations for all the subjects.
2. Statistical analysis and compilation of results : Data generated by the occupational health survey was subjected to detailed statistical analysis with the help of SPSS including statistical comparison of workers and controls and multiple regression to derive an appropriate PEFR prediction equation.
3. Working conditions survey : In each of the tanneries studied, a comprehensive survey of working conditions was performed on the basis of a tannery questionnaire containing questions on work hazards and environmental conditions in each tannery.
4. Preliminary hazard analysis : A team of occupational health and safety experts along with specialists in tannery process and technology sequentially visited selected tanneries, representative of major categories, with an environment/work hazard proforma. Subsequently the team conducted a work-station wise analysis of sources and effects of hazards, hazard index, recommended actions and the likely effects of action for the 17 significantly hazardous work-stations in the tanneries.
5. Environmental contaminant measurements : In collaboration with R.L.I., Kanpur measurement of airborne contaminants (dusts and vapours) was performed at workstations like grinding, buffing and spray painting sections where levels of contamination were significantly affecting workers health.

The situational analysis yielded a wealth of information, essential for identification and planning of interventions. The major outcomes may be summarised as -

- a. A comprehensive morbidity profile of tannery workers, revealing a significantly high proportion (28.17 %) of workers suffering from occupational morbidity, involving skin, eyes, respiratory tract and musculoskeletal system. Comparison of workers and controls also revealed a range of illnesses with undefined or partial correlation with occupation. The workstation-wise morbidity profile forms a

baseline to evaluate the effectiveness of interventions.

- b. A complete socio-economic profile of tannery workers with details of education, income, employment particulars, migrational background, workstation distribution, personal sanitary habits and information on utilization of medical services.
- c. A workstation-wise cross-section of frequency and type of accidents, usage of protective devices and availability of facilities at the workplace.
- d. A detailed identification of health and safety hazards in the work environment at each workstation with data on levels of environmental contaminants and technical recommendations on methods of improvement.

Subsequent to the situational analysis, the multifaceted intervention programme was initiated with the following components:

A. Involvement and Support of the Entrepreneurs

From the commencement of the programme, establishing rapport and motivating the tannery owners to take initiative with respect to improvement of the work environment was of utmost importance. In an industry as traditional and insulative as the tanneries of Jajmau, any kind of intrusion into the tannery domain was viewed with skepticism, at best, and often with considerable suspicion.

A multifaceted approach, with an emphasis on positive example and support, rather than negative observations or criticism, was adopted at each stage.

a) Meetings with tannery owners and coordination with Tanners associations:

In the initial phase of the programme, it was essential to establish the 'bona fides' of the programme and establish a working relationship with individual tanners. Meetings with individual tanners were organized through the two major associations of tanners in Jajmau-Hindustan Chamber of Commerce and Small Tanners Association. Meetings convened by the associations were initially a forum for considerable debate yet also provided a platform for the tanners to voice their doubts, suspicions and ideas about not only the occupational health programme but also the pollution control measures planned for this industry. An open and supportive approach, clearly stating the mandate, and clarification on the limited sphere of responsibility of the project ensured that initial misgivings gave way to confidence building.

What finally brought about the support of tannery owners towards improvement of the work condition, was the linkage being established with the concept of industrial counselling. It includes aspects as better and more efficient production processes and a higher productivity through an improved industrial environment.

b) **Involvement in the occupational health survey:**

The entire approach and methodology of the survey ensured a basic confidence in the aims and outlook of the programme. The simultaneous administration of treatment to all those affected by illness, whether of occupational origin or not, established that the emphasis was on positive action, rather than 'academic' study or collection of 'punitive evidence' (suspicions generated by previous experiences). Personally talking to every third person in the tannery (the study sample), including those from the staff and supervisory sections, and provision of medication, generated considerable goodwill in the entire community of the tannery - with the tannery owner often assuming the role of 'benefactor'!

c) **Awareness camp for tannery owners:**

After the completion of the situational analysis, introduction of modifications in the workplace was the next stage of activity. This was to be carried out by the tannery owners with support from the Project and other agencies and thus necessitated suggestions and acceptance of the owners on the need for change. The first major thrust with this objective was the awareness camp in which experts from Regional Labour Institute, Directorate of Factories, Central Leather Research Institute and the Project interacted with about 40 tannery owners. While the owners were acquainted with the findings about working conditions, they were also exposed to the idea that improvement of the work environment is linked with increased productivity and a higher motivation of the workforce. A range of information about modifications which could improve the environment both within and outside the tannery was presented and discussed. The awareness camp also proved a motivating factor for the tannery owners to participate in the subsequent workshop.

d) **Workshop on 'Higher productivity & a better place to work':**

This workshop, organised in collaboration with I.L.O. and other agencies, proved a turning point in the involvement of tannery owners in the process of industrial change. The five day workshop involved a checklist exercise, faculty presentations, individual enterprise visits and preparation and presentation of action plans by the entrepreneurs. With presentations and discussions on diverse areas such as 'productivity principles in the tanning industry', 'tannery solid waste management', 'control of hazardous substances' and 'welfare facilities', a wide ranging interaction on the interlinked issues of productivity, working environment and waste management ensued, with active participation by the owners. This convergence of experts and also of issues proved a catalyst for the industrial counselling concept.

B. Involvement of workers

The attitudinal modification of tannery owners was paralleled by the active involvement of workers in the process of workplace improvement. The sensitization of workers began during the occupational health survey with sharing of information about hazards and work related diseases. With a change-oriented approach, the workers were convinced that this was a programme for their improvement. Simultaneously with the intervention programme, a set of activities was

developed which would ensure the active involvement of workers in ensuring better occupational and environmental health conditions in the tanneries. The specific programmes developed for the workers can be summarized as follows:

i) Training and follow-up of first aid and safety volunteers:

Two workers each from every one of the 20 tanneries studied were selected for training in basic first aid relevant to tanneries, environmental effects of chemicals and substances in the tannery and safety & health related practices relevant to tanneries. After basic training of these volunteer workers, follow-up programmes were also conducted to gain feedback, resolve problems related to the use of first-aid kits and reinforce knowledge already imparted.

ii) Installation of First aid and health kits:

Specially designed first aid and health kits were supplied to each of the tanneries from which health and safety volunteers had been trained. These contain equipment appropriate to the first aid and health problems commonly found in the tanneries. While the contents are administered by the trained volunteers, the responsibility of replenishment of these kits is of the tannery owner.

iii) Health and Safety councils:

With the implementation of interventions in the tanneries, participative forums to ensure long-term continuation of the process of workplace improvement are being introduced in the form of health and safety councils. These are statutorily mandatory bodies to be present in any hazardous factory, consisting of equal number of representatives of management and workers, responsible for monitoring the existing environmental conditions and suggesting and supervising improvements in environmental conditions. These councils can also act as forums for raising environmental issues and nuclei initiating activities for environmental improvement within and beyond the tannery workplace.

C. Formation of Institutional Framework of Agencies:

The process of introducing industrial modifications to improve the work environment is a multifaceted activity with legal, technical, medical and social aspects. This has required establishing coordination between various concerned agencies and establishing an institutional framework to ensure continuity of the process of change. The workshop on Higher productivity and a better place to work provided an initial forum for the coordination of efforts by various agencies. The principal agencies involved at the local level included Regional Labour Institute, Kanpur, Directorate of Factories (U.P.), Central Leather Research Institute, Kanpur Medical College and Kanpur Nagar Mahapalika. Keeping in mind the need for coordination, a task force for improvement of environmental conditions in tanneries at Jajmau, Kanpur has been formed with the specific purpose of maintaining an active coordination of activities by the agencies mentioned above, with participation of heads of these institutions along with representatives of the Project. This institutional framework would provide long-term

support to the implementation of interventions in the workplace.

D. Industrial Modification

Based on the hazard analysis and other findings of the situational analysis, and drawing upon suggestions generated during the Workshop, certain priority industrial modifications have been identified and are in the process of implementation.

While technical support is being provided by the project, the basic financial responsibility lies with the tannery owner to carry out these interventions -

a. Vapour reduction/air pollution prevention system in spray painting sections : Spray painting with the usage of a complex mixture of organic solvents is one of the most hazardous sections in the tannery. Firstly, the worker is constantly exposed to high levels of organic solvents which build up in the ambient atmosphere and cause lung and central nervous system ailments. Additionally, there is a significant fire hazard due to heated inefficient exhaust fans in presence of high vapour concentrations. Finally, there is significant air pollution due to discharge of solvents and paint particles into the atmosphere. A unified exhaust system with ducts centrally connected with a blower has been installed to efficiently exhaust air from both above and below the spray horse, thus markedly reducing exposure to the worker. This system also keeps the mechanical blower and vapour separate from the motor thus eliminating the fire hazard. And installation of a filter before the exhaust is discharged into the atmosphere reduces air pollution.

b. Guard operation and automation of hydraulic press machine:

One of the most accident prone machines in the tannery is the unguarded hydraulic press operated by two persons which regularly causes severe hand injuries and amputations to the helper to the operator. Tannery owners are also dissatisfied with its manual operation without pressure/timing control. A redesigned press has been brought into operation which is guard operated and also has an emergency stop mechanism and pressure cutoff system. This totally eliminates the possibility of accident. Further, with pressure and timing control, the quality of production goes up markedly which is a major advantage for the tannery owner. Now the principal Indian manufacturer of presses based at Jajmau, Kanpur has been involved in changing the design of his press along these lines thereby making it both safer and more productive.

c. Exhaust and dust collection system in buffing section:

The buffing section where the surface of leather is exposed to an abrasive roller generates considerable leather dust causing serious lung problems. The fine particles also tend to settle on freshly painted leather and spoil its surface. To prevent this, a centrally connected exhausting system for several machines connected to a dust collector has been installed which results in marked reduction in dust levels and better work efficiency.

d. Dust suppression system in grinding section:

Vegetable tanning involves the pulverising of bark and nuts used for tanning. The grinding of bark/nuts, removal of ground material and dumping this in leaching pits are all extremely dusty operations causing occupational asthma and conjunctival irritation. The dust also settles on freshly spray painted leather and spoils its finish. Cost effective mechanism is being implemented which involves a specially designed chute to collect the ground material leading to a filling mechanism to pack the material into large bags. Further transfer of these bags would be comparatively dust-free and local exhaustion at filling and grinding sites would reduce dust levels there.

e. Introduction of breathing apparatus for confined space operations:

Confined space operations involved in cleaning of pits, tanks and sewage lines within the tannery have caused innumerable fatal accidents due to exposure to Hydrogen sulphide gas which is generated by the putrefying organic matter. A relatively low-cost and appropriate solution to this problem has been designed by using the air compressors currently being used in the tanneries. These are to be connected with small storage tanks with valves which would supply air under positive pressure to masks to be worn by all operatives entering confined spaces for cleaning or maintenance operations. Thus existing resources within the tannery would be utilised to evolve a system which could be made universally applicable.

E. Development of Promotional Materials

Based on the experiences being gained in the process of situational analysis and interventions, promotional materials are being developed for the following categories :

Tannery workers - besides safety posters which have been prepared and convey messages related to specific health and safety precautions to be observed in the tannery, manuals and leaflets on first aid, detection and action in relation to occupational diseases, specific safety measures to be taken at different stages in the tanning process and awareness of general environmental issues are also to be prepared.

Tannery owners - based on the experiences of the Workshop and subsequent industrial modifications, a manual dealing with the possible improvements in tanneries with the combined objectives of ensuring health and safety, improving productivity and improving environmental conditions is to be prepared.

Health professionals - manual containing details of occupational diseases prevalent in this branch of industry, their diagnosis, management and prevention, to assist health professionals in dealing with commonly occurring occupational health problems.

Reflection

It is interesting to observe how commencing from an emphasis on purely health related issues in the workplace, the programme has assumed increasingly broader dimensions. Today the working philosophy and approach is that of industrial counselling, aiming at providing the

entrepreneur and the workers with a package of technical assistance and support on issues ranging from better health and safety conditions in the workplace, improving productivity and better management of the environment within the enterprise. Given the inherent linkages between these various areas, a coordinated approach could result in a much more active involvement of both employer and employees in the management and control of the environmental hazards generated by their industry. Environment within the workplace and environment beyond the workplace form a dialectical unity, and neither can be adequately dealt with without appropriate attention to its converse.

For initiating the process of industrial counselling, the baseline established through a situational analysis has proven its worth. Not only for the direction it gives to the intervention programme, but equally important is the rapport and confidence it establishes with workers and employers.

4.2 The Occupational Health Programme for Carpet Weavers in Mirzapur

The objective of the Occupational Health Programme in Mirzapur is to improve the safety and health conditions of workers engaged in the carpet industry. Initially, efforts were directed towards the improvement of health and safety conditions within the looms. The situational analysis and the in depth survey directed the attention to a broader concept, including functional literacy of child and adult workers, improvement of the health situation of the population and contribution to the organization of the labour force. The main reasons for this reformulation are as follows:

- In Mirzapur, the main industries are the carpet weaving and the brass ware industry. Both industries are categorized under the informal sector. Their employees are not registered under the Employees State Insurance Scheme (ESI scheme) and have no access to ESI health facilities. The laws aiming at the protection of the labour force do not include the informal sector. Another salient feature of the labour force in Mirzapur is the relative high proportion of child labour, in the carpet industry up to 15%.

In the initial phase, the carpet industry, being the main industry in Mirzapur, was included in the study. However the brass ware industry is more hazardous to the environment than carpet weaving: contamination of the soil and water by heavy metals and detergents, chemicals and polishing materials.

In view of the results of the situational analysis the Occupational Health Programme was restricted to the following activities:

1. Simple interventions for carpet weavers
 - a Improvement of lighting in the working sheds/looms by placement of fiber glass tiles

Tiles have been installed in 30 looms. The original fiber glass tile arranged through UNICEF proved to be of bad quality and fiber glass of the local market was purchased and installed. However, the cost (81 Rs) proved to be a hindrance for total acceptance in

the project area. Nevertheless, some owners of looms accepted the idea and installed tiles themselves at own cost. A positive development in itself since the aim of the project is to make interventions sustainable and replicable.

b. Provision of spectacles

32 spectacles have been provided to carpet weavers in the first stage. This stage proved that bifocal lenses are not useful for weaving purposes.

c Ergonomic improvements in the looms

Ergonomic improvements in the looms have not yet been taken up. These kind of interventions should form part of an overall house and loom improvement programme. It is suggested to the project to organize this part of the programme in cooperation with the Institute of Housing Studies in Rotterdam to formulate a low cost house improvement programme in the project region.

2. Training of safety and first aid volunteers

9 safety and first aid volunteers have been trained in the treatment of simple diseases and accidents and received a first aid box. They are the key persons in the three hamlets and function as interlinkage between project staff and the community. They inform the community about the awareness camps and other activities which are executed by the project. They have also a function in referring people to the Tuberculosis center and to other health services available like private practitioners and government health services.

3. Awareness camps

5 awareness camps have been organized. In the first camp, the results of the situational analysis have been presented and discussed. Measures to prevent diseases were discussed. An outline of further activities of the Occupational Health Programme was presented. Other subjects in the awareness camps were: eye diseases and their prevention, backache and postures in the pits, its causes, prevention and remedies. Exercises were demonstrated during the camp, which can be done at home as self remedy. A physiotherapist will support the community and he will organize backache prevention exercises for one week. A person will be trained for further promotion of the exercises.

During the last awareness camp, the pilot area was affected by a cholera epidemic. It was decided on the urge of the community, to take action on a priority basis immediately. First aid volunteers and community leaders visited the water storage and informed the authorities that the water should immediately be protected. The use of Oral Rehydration Solution was taught during the first aid courses, was promoted and taught to all families in the affected area. A smooth referral to the Infectious Diseases Hospital (IDH) was ascertained. This cholera epidemic, although tragical in itself, had a positive effect on community organization, the use of Oral Rehydration Packages and the collaboration between the community, municipality and the project staff with regard to

health issues.

4. Literacy programme

In view of the low overall literacy, a literacy programme for child- and adult weavers was started. In the three hamlets educational committees, with seven members, mostly informal leaders of the communities, have been organized who work as interlinkage between the community and the project staff. The programme is running at 7 places in rooms provided by the community as well in open air. There are 2 courses for female adults, 2 for male adults, 2 for male children, and one course for mixed female and male children. The courses are given 6 days a week. Times differ: 3 courses are organized from 2 - 4 p.m., 2 courses are given from 6 - 8 p.m. and 2 courses are organized between 8 and 10 pm. The mean attendance is 30 people per place. The overall goal of the literacy programme is to improve functional literacy, eg. how literacy contributes to an effective communication between the community and the outside world. It is more than learning the skills of reading, writing and arithmetic, it should contain a direct relationship with their daily life and problems. The community should know the channels to the municipality, to the post office and they should know the meaning of signing agreements and contracts.

The curriculum for the children consist of basic reading, writing and arithmetic, which is conducted during three months. Subjects for the future consist of water- and sanitation aspects. personal hygiene, working conditions and the improvement of their professional efficiency and social life. Other subjects cover health education and human rights.

The course for adults follow the same pattern. During the adult literacy programme, community members asked for other teaching and training programmes in the field of income generation activities. Sewing has been proposed as a first priority for women. These new training activities may serve as a starting point for activities of the SEWA income generating project.

5. Health care, including referral support

The Occupational Health Programme trained the first aid volunteers to refer patients to health facilities. It also opened an Occupational Health Centre which aims at simple Mother and Child Care services, treatment of simple diseases and referral. At this Centre, made available by the community, consultancy services are being provided by local private medical practitioners.

Reflections

The Occupational Health Programme for the carpet industry in Mirzapur provides an example of the approach and methodology which might be followed for the small scale/cottage industries. The nature of the interventions taking place has been determined not only by the outcome of the occupational health hazards encountered in this industry, but by an assessment of the general morbidity as well. For the carpet industry the scope for industrial modifications was found to be limited and has been confined to simple and low-cost interventions. It includes the

improvement of light conditions. It was realized that the prevailing health conditions in the concerned pilot area were more determined by the overall sanitary- and environmental conditions prevailing in the area typical for slum areas than by the working conditions in the looms as such. An exception has to be made for the ergonomic design of the looms which often result in backache problems. It was felt however that this specific aspect was beyond the purview of the project. For the same reason the formation of carpet weavers cooperatives was not taken up although it could certainly have contributed towards improvement of their living condition and thereby the health of carpet weavers and their families. On an experimental basis a literacy programme and health services support system have been introduced in order to assess if through these entries a contribution could be made towards better environmental and sanitary conditions. Although it is too early to draw conclusions on the effectiveness of this approach, it is felt that the interlinkage established between interventions in the work environment and the living environment, a climate conducive to change is created.

A wider concern is the sustainability and replicability of the different programme components covered under the Occupational Health Programme. In the case of Mirzapur the health services support system at the pilot area will be integrated with the Urban Health Care Programme, being established at Mirzapur through other channels. It could serve as a model community based health care with decentralized health services providing direct entries into the slum areas.

The literacy programme is executed in close collaboration with the local office of the Adult Education Programme. If found to be successful, literacy programmes can be utilized as well for promoting better environmental- and sanitary conditions and improvement at the work environment.

5. COMMUNITY INVOLVEMENT IN THE PROVISION OF LOW COST SANITATION UNDER URBAN SLUM CONDITIONS

5.1 Outline of the Low Cost Sanitation Programme

The low-cost sanitation programme consists of two components; private- and public latrines. The public latrines are perceived to address the needs of commuters and those who cannot afford, are not able or have not enough space to have a private latrine constructed. Both in Kanpur and Mirzapur about 12 public latrines are being constructed. They are from the common Sulabh Shauchalaya type and will not be further discussed in this context.

The private latrine construction programme covers about 5000 latrines/conversions at Kanpur and about 9000 latrines/conversions at Mirzapur. On-site sanitation is provided in areas which cannot be sewered. Connection to the existing sewers turned out to be only possible when the existing network is rehabilitated. The third phase concerns the connection to new sewers.

A first assignment for construction of latrines was given to a large contractor with a good reputation in this field. Even although attempts were made towards mid-term corrections, it was found that even after a one-year period the physical progress made was extremely slow. Besides, field visits indicated a poor quality of work while a growing disenchantment was noticed among the beneficiaries with the sanitation programme. The latter not only for its quality aspects, but for the procedures followed as well.

Therefore, the two municipalities together with project staff, decided to review the progress made. Status reports were prepared which reflect on the experience gained over a period of more than a year. We summarize the findings below.

5.2 Bottlenecks and Constraints observed in Private Latrine Construction

Identification/selection of beneficiaries

The procedure adopted was that the contractor was made responsible for collecting and submission of the names of the beneficiaries. Interested households had to fill in an application form, pay the registration fee after which the names were to be entered into the registers of the municipality.

The status review learnt that along the way, certain lapses occurred. The major observation was that the list of beneficiaries provided insufficient information to locate all the listed households again. In addition, only partially adherence was made to a phased implementation of the programme. On-site sanitation was proposed as well for areas not covered by sewers.

A more serious matter was that reports were received from different slum areas with complaints that although registration fees were collected, no latrine was constructed. On investigation it was found that the names of the concerned households were not registered with the municipality.

Slow Progress of Work

The normal expectation is that a contractor shows keen interest in taking up a maximum amount of work. Not so in this case, because the contractor concerned, although certainly having the capacity to take up large scale construction work, was only able to construct a few hundred latrines in Kanpur and Mirzapur each, over a period of more than a year.

The only possible explanation can be found in the financial procedure adopted. The contractor was provided with an advance which nears the total cost of construction. The advance was given based on the list of beneficiaries submitted to the executive agency. This construction makes it attractive for a contractor not to take implementation too serious. Since the money is already paid, no incentive remains to do the actual construction in a timely manner with adherence to the quality standards.

Quality Aspects

Notwithstanding a fairly strict monitoring of the construction programme by project staff and staff of the executive agencies, a high percentage of about 40 percent of latrines constructed, showed technical defects. The major defect observed were undersized leach pits which indicates that latrines were constructed in places with insufficient space. Other defects were relatively minor, but indicate a lack of concern and insufficient skills to adhere to the quality standards.

What was found frequently as well were latrines constructed on the edge of vacant plots, latrines installed right in the living room, seats facing west for muslim families or east for Hindu families which is objectionable for religious reasons. Inappropriate positioning of the latrines can only be explained out of a lack of assertiveness with the beneficiaries towards staff of the contractor agency. Construction of latrines at vacant plots is related to a desire for markation of the plot and its authorization.

Use of the Latrines

A strong relationship was found between the availability of a superstructure and actual use of the latrine, condition. At the time of the survey 30 to 40 percent of the latrines constructed, were not used for this reason.

The explanation is found in the provision of latrines upto plinth level only. The construction of a superstructure is left to the beneficiaries. It has an in-built contradiction in the sense that for construction upto plinth level an attractive financial arrangement exists. Fifty percent subsidy with the loan to be recovered over a period of 5 years against an interest rate of 6 percent. On the other hand, the construction of a superstructure of brick walls, wooden door and a roof top of galvanized iron is costing between Rs. 600 to Rs. 700 and has to be paid in one go.

Misconceptions

The limiting factors were not exclusively confined to the mode of implementation of this programme. Certain misconceptions prevailed as well with the target population. The popular belief is that in construction a cement sand ratio of 1:3 should be used, while the design specifies a ratio of 1:6. Questions were raised as well about frequency and method of emptying the pit after it has been filled. It was considered to be unhygienic and costly to have it emptied. The fact that after digestion over a period of one year, compost would remain which does not pose any health hazard in removal, was not widely known.

Another common misunderstanding encountered was that through the digging of pits the walls of the house would collapse. It will only be so if a certain minimum distance is not adhered to.

5.3 Measures towards Improvement

Based on the outcome of the status review, an agreement was reached between all parties concerned, to modify the programme. Its main features are discussed below.

Preparation of the beneficiary lists

Instead of identifying beneficiaries only, it was decided to conduct a house-to-house survey area-wise in order to derive at a comprehensive overview of the sanitary conditions. At the same time the beneficiary lists were prepared. For the house-to-house survey, a pre-established questionnaire was used which do provides sufficient details for proper planning and execution of the programme. A survey format is enclosed for reference. Subsequently, a phased planning was prepared and established on maps.

The survey was conducted directly by the executive agencies, for which additional staff was assigned the responsibility exclusively for this purpose.

The engineering staff assigned to this task was supported by community workers from the municipalities stationed in the project areas and were supported in their field work by community volunteers from the respective pockets. The latter category forms part and parcel of the network of change agents established by the Ganga Action Plan in Kanpur and Mirzapur and does comprise more than 500 persons each at present.

The volunteers assisted the survey team in investigating the availability of space for leach pits, whether on-site or off-site sanitation has to be provided, which size and type of design of leach pits was required, etc. Simultaneously they promoted in their areas the adoption of sanitary latrines and explained the modalities for acceptance and construction of latrines.

Promotion activities during construction

Along similar lines, community volunteers are being involved during construction activities, to motivate the households which were previously not yet ready to accept sanitary latrines, to do so. To convince them is facilitated by an area-wise approach in which a better quality of work and acceptance by neighbours are important factors

thereby. Certain misconceptions are addressed by providing information about the technicalities involved to the community volunteers and through them, to the target population.

A departure in promotion activities was that the construction of a superstructure by the households themselves was being promoted. It implied that although in principle the possibility was opened to opt for a superstructure through an additional loan arrangement under separate financing, no efforts were made to materialize this option. It was felt that it would increase the financial burden of households, while by using simple and locally available construction materials at least provisional structure could be made. It was noticed that by fully incorporating the construction of a superstructure through self-help in the promotion activities, the actual use of the latrines installed sharply increased.

Construction through masons cooperatives

Under the Ganga Action Plan, a masonry training programme for female construction workers had been taken up. The purpose was to increase the share of women involved in the more skilled jobs available through construction work. The training consisted of 3 weeks classroom and 3 months on-the-job training. The first batch of trainees consisting of 15 women each in Kanpur and Mirzapur, formed afterwards a society to take up construction work directly. Presently, the second batch is undergoing training.

It was found that although the female masons have less working experienced, they were able to do a much better job than their male counterparts from contractor side. Being highly motivated and properly trained, they are much more conscious about quality aspects.

During field investigations, it was very normal to receive complaints from masons working for a contractor, that they were not allowed or not knowledgeable enough to adhere to the quality standards. The first relates to compromises made by the contractor on the quality of work in order to ensure additional profits and the second aspect relates to insufficient training.

It was therefore decided to organize a skill upgrading programme for petty masons from the project area. The programme was of 3 days duration and had as main aim to learn from earlier mistakes made. Field visits were made to learn from the past experience. At the same time it was felt that masons, both male and female, could play an important role in promotion of better sanitary practices. Part of the course was directed therefore to equip the masons for this task.

The formation of registered societies of masons has the following background. There is a multiplicity of Acts of the Government of India, which protect the construction workers from exploitation by contractors. The following acts are relevant for the industry:

1. Workmen Compensation Act, 1948
2. Minimum Wages Act, 1948
3. Inter-state Migrant Workmen Act, 1957
4. Contractor Labour (Regulation and Abolition) Act, 1970



Provisions cover aspects as minimum wages, health benefits, etc. Enforcement is difficult however for the nature of the construction industry. The workers do find seasonal employment most of the time and have to take up other jobs in the off-season period. The construction industry also involves the largest percentage of migrant labour which shifts from one place to another. Its labour force is unorganized and open to exploitation from contractor side.

The formation of registered societies of petty masons from the area itself enhances the accountability for the work done. It operates its own bank account and the profits go directly to the masons themselves.

Initially, there was the bottleneck of the societies not having the financial muscle to compete for work orders directly. Although societies can obtain a government order which entitles them to 80% advance, it is not sufficient to start work independently. The assignment through a government order has the additional disadvantage that it adheres to PWD rates, while contractors get paid according to market rates. No advance is provided to contractors however. For the large differences that through inflation can evolve between the PWD rates and market rates, the societies worked below profit margins for a considerable time.

For the support of both local governments and the Ganga Project Directorate towards this experiment, the initial bottlenecks have been removed. The societies were given work orders/initially covering a limited number of latrines only, financial support was increased and the cost estimates were adjusted taking into consideration the prevailing market rates.

5.4 Reflections

The change in modus vivendi in implementation of the LCS programme, has certainly contributed to a better quality of work and a greater acceptance of sanitary latrines.

Although the outcome is positive in itself, it is too early to present the approach being followed as an example for other sanitation programmes. The provision of sanitary latrines has to go hand in hand with a change in sanitary practices, in order to maximize the impact on the prevailing health conditions. It is too early yet to claim this effect. Besides, insufficient experience is available on proper maintenance of the latrines in terms of removing the sludge from the pits, regular cleaning of the sewers, etc.

The second observation is that the spectrum between on one side private latrines and on the other side, public latrines, is too wide. The estimates are that about 30 percent of the target population cannot avail of individual latrines because of a lack of space, the house being on rent with the owner having no interest or the household being too poor to opt for a latrine. There are doubts whether public toilets alone can answer the needs of all those households who are not in a position to opt for a sanitary latrine and an intermediate system between private - and public latrines might be required.

In terms of replicability the approach followed has certain limitations. The training of masons and the formation of societies is only feasible when sustained employment can be offered through sizeable

construction programmes. Diversification of skills is a long term requirement.

The preparation of the lists of beneficiaries by the executive agencies themselves, was yielding positive results because of their interlinkage with community workers from the municipality working in the concerned project areas for already a considerable period of time. Through them contacts could be established with community volunteers acting as intermedium between the executing agency and the target population. These volunteers were well acquainted with the programme and its objectives through their earlier involvement in other programme components. They did participate in orientation and follow-up programmes organized and conducted by the Municipalities which sensitized them and made the environment conducive towards change.

6. THE OPERATION AND MAINTENANCE OF HANDPUMPS IN URBAN SLUM AREAS

6.1 Introduction

When the project started in 1987, a crash programme was taken-up to provide emergency relief to the target population in terms of sanitary facilities. To establish the priorities for interventions, a community survey and baseline survey were conducted. The surveys were carried out in a period in which a third successive drought year resulted in drinking water scarcities which did seriously affect the population.

The inventories made on existing sanitary conditions established for Mirzapur, that large parts of the core city were served with piped water supply providing water through private and public taps. However, owing to leakages in the network and water spillages, an estimated percentage of 70 percent of the water supply did not reach the consumers. The water losses did result in under-pressure in the pipes, contamination of the water through dirt sucked into the system and limited hours of supply. Long queues in front of the public standposts were a common sight. Households having private connections often resorted to suction pumps being connected to the pipe lines at the hours of supply. An undesirable situation considering its health hazards but for the prevailing water scarcities, understandable in itself.

In the core area of Mirzapur but even more so in the fringe areas there was a large dependance on traditional wells numbering more than 200. At that time most of the wells had gone dry and those still in operation were highly contaminated.

In Jajmau, Kanpur, the situation was not much different. Water scarcities prevailed, especially in the higher elevations, where tap water could not reach owing to the low pressure in the pipelines. In the Northern belt, characterized by an intermergence of tanneries and slums, the main source of drinking water were public taps being provided by tanneries operating their own tubewells. The provision of tap water was found to be relatively better as compared to Mirzapur, with estimated losses amounting to 40 percent. On the other hand, the number of in-use wells was considerably less.

Based on the inventory taken and the need assessment, priority lists for installation of handpumps were prepared. It covered those slum pockets which faced an acute shortage of drinking water. At a later stage, additional lists were prepared for those area's where shortages were less acute. It concerned those areas covered by piped water supply and which would benefit from the planned rehabilitation programme of the piped water supply system but after a number of years only.

Below, we describe the methodology followed in the site selection of handpumps. We present as well the attempts made towards the establishment of an O&M system with the active involvement of especially women. Rather than describing the state of affairs, we will reflect on the process since it is felt important to share the experiences gained in the development process.

6.2 Handpump site selection

The need assessment included the inventory taking and mapping of all existing water sources. Group interviews were held by community workers

in more or less homogeneous clusters comprising 50 to 200 households. Through this process, project staff and community workers from the municipalities could familiarize themselves with the project area and did establish the first initial contacts in the different slum pockets.

The next step was to determine the sites where the handpumps would actually be placed. It involved an elaborate participatory process aimed at reaching a consensus on the most suitable sites for each priority area. In each area community members were invited to hold community meetings to identify their own needs and indicate their preferences for sites. Separate meetings were conducted of men and women in which lists of preferred sites were prepared. In the concluding meeting the proposals were discussed and the technical feasibility of the proposed sites was assessed. The system of having separate meetings first of women was not always readily accepted.

In Ooncha Tila, one of the slum pockets in Jajmau, men and women were holding separate meetings to decide on the site preference. Especially important so because the area is predominantly muslim. Without initial segregation it would not have been possible for women to have their say. When it turned out that the men's list and the women's list showed major differences it resulted in a strong defence of the women of their own choice. During the meetings, one of the men could not stand it any longer and shouted at us, 'Is this the attempt to make our wives rebel against us. They have started quarreling and disobeying at home as well'. After the first man came out like this, it was learnt that many other men shared the same misgivings.

Surprisingly enough, after explaining the importance of involving women in the decision making process regarding the location of water sources, peace was settled again and the men present accepted the arguments. It is mentioned a surprise, because it is something you expect to find in text books but is not expected to work as an argument in slum level discussions.

After this argument at Ooncha Tila, more attention was paid at subsequent meetings, to possible reservations with men about involving women in the process of site selection.

What is described above, gives a fairly rosy and smooth impression of the process followed in site selection. However, there were constraints as well some more serious than the others, but nevertheless constraints. We discuss them below.

The caste factor

It would be incorrect to say that the decision making process can be totally left to the community. For that, the concept of a community needs to be defined first. Mirzapur is basically a medium sized rural service centre, in which the caste factor still plays an important role. In Kanpur, being a large industrial city with a sizeable migrant population the caste factor is less dominant. Separate castes and sub-castes for their habitat tend to cluster in pockets. Caste feelings are still strong enough to prevent lower castes from using the same water source without even raising objections. In organizing community meetings, this factor had to be taken into consideration, especially in Mirzapur. The clusters were selected therefore, in such a way that the use of the handpump could not be monopolized by a higher caste. The method there is easy. Make sure that the site of the handpump is located within the cluster of the lowest caste. It is a good preventive measure against caste monopolization.

Not in all cases a consensus could be reached and the decision regarding site location was kept pending and had to be abandoned in a few cases. It happened where small clusters had to share a handpump and could not reach a consensus.

The political factor

Often the provision of public facilities is considered to be not a right but a political favour which is arranged for by a politician for its vote banks through its contacts and influence over the bureaucracy. The site selection process is determined accordingly, with suggestions coming from the local followers of the politicians. The choice of sites is thereby not necessarily confined to the better off areas because minority communities and scheduled castes, often being the inhabitants of slum areas, do form important vote banks. The result is handpumps which are conveniently situated for local slumlords having the appropriate affiliations with the party that happens to be in power or sites which can hardly be qualified in terms of priority. Since politics tends to be still overwhelmingly a man's world it is obvious that women are not involved thereby in the process.

This factor could not be totally avoided in the process adopted in site selection. When the lists were finalized through a participatory process and were submitted to the concerned authorities, alternative sites and lists were submitted through the political channels.

In this situation it turned out to be critically important that a proper justification based on priority needs, was made beforehand. A consensus could be reached on most of the identified sites and were endorsed accordingly by the political level. Some good suggestions for additional sites were given as well, but it happened in a number of cases that political priority gained preference over actual needs. It brought project staff in the impossible situation to explain to affected communities, why sites selected earlier, had to be abandoned. Rather than justifying it, the staff confined itself to explaining the situation and in the mean time did make efforts to have the decision reversed.

The individual factor

There is no need to romanticize the process of community participation in site selection. Every individual tends to prefer a site that is convenient to himself/herself. Discussions initiated on community preferences for a restricted number of handpumps can result in strong individual objections and even fights. There is not much to do against it except for establishing first the required number of handpumps and wait till a consensus has emerged. Outside interference to satisfy individual preferences should be avoided. A condition thereby is that the informal opinion leaders from within the community are identified first and are in the position to guide the process.

6.3 Handpump installation

Although the installation of the Indian Mark II handpump is done on a wide scale, it turned out that, especially in Kanpur, the quality of installation was poor. The main reason was the involvement of small contractors with a lack of adequate equipment and skills. The result was a large number of handpumps being out of order or not giving sufficient yields.

A task force had to be fielded consisting of project staff and staff of the implementing agency, to assess the condition of each handpump installed and to propose corrective measures. The task force was supported by Unicef office, Lucknow. Based on its findings repair work on handpumps was carried out or redrilling done.

A main bottleneck in installation of handpumps is the lack of proper supervision. Therefore, it was decided to facilitate more community control on installation through training of handpump users representatives in proper installation procedures as well. It concerns aspects as providing information on required depth, number of pipes to be used, etc.

6.4 Operation and Maintenance

To facilitate the community management of the O&M of handpumps, a total number of about 300 handpump users representatives have been trained in Kanpur and Mirzapur each. They are mainly man-woman teams, in which one team takes responsibility for the handpump in their vicinity. They were selected based on community consensus but under the condition that they should be users of the handpump water themselves.

The initial training programme for handpump users representatives had the following objectives:

After the course the participants should be able to do the following

- to carry out preventive maintenance such as tightening of the nuts and bolts and greasing and oiling of the chain.
- to promote that the handpump site and its surroundings are kept clean.
- to promote safe water practices within their community
- to carry out simple repairs
- to identify the causes of breakdown and reasons for defects of the handpump and duly report to the water works department for adequate action.

In addition, on-the-job training was provided to the maintenance crew

of the water works department by carrying out repairs on defect handpumps.

The training programme was for two days and was conducted phase wise following the progress in installation.

The experience gained with conducting the training programmes and monitoring of its impact in terms of the effective utilization of handpumps installed, did result in a number of modifications. For the lack of response of the water works department towards complaints received, the reporting system for issuing complaints was revised. Loopholes were closed and the responsibilities of the handpump users representatives vs the maintenance crew of the water works department were specified. It was found that most repairs were carried out through community initiative thereby using mechanics from the private market. Most of the time, these mechanics did more damage than good, which in itself resulted in friction with the waterworks department. As a policy decision it was agreed that repairs would be totally the responsibility of the water works department which clarified matters to a large extent.

From a strategic point of view and under the fortunate circumstances that the Ganga Action Plan covers a wide range of sanitary interventions, the network of handpump users representatives was increasingly mobilized to make other sanitary intervention successful. The first step was to seek their support in community management of all in-use water supply sources in their vicinity, with the exception of the piped water supply system. The rehabilitation work for this latter component has been taken up only recently after improving the water supply capacity first.

The other water sources being covered now are in-use wells and handpumps installed at earlier stages. Since these sources remain in use till at least the piped water supply has been improved, it was felt necessary that the quality of these sources should be controlled as well. Water quality monitoring was introduced. With the support of handpump users representatives, regularly water samples are taken of each source and checked on possible contamination in the laboratory. Chlorination takes place as per need and requirement, again with the support of h/p users representatives.

Another development which has taken place is that this network gets increasingly involved in other sanitary interventions taking place. The network of handpump users representatives is well spread over the project area and covers all slum areas. The handpumps are thereby used as rallying point for mobilizing communities for other interventions, especially the sanitation and solid waste schemes.

6.5 Monitoring and follow-up

In monitoring of the effective utilization of the handpumps two aspects can be distinguished. The first aspect is the establishment of an adequate operation and maintenance system. This need has been answered to a large extent. Through a regular review of the progress being made, step-by-step, the system was modified and improved. The bottleneck at the moment is a regular supply of spare parts and bleaching powder. It requires fixed budget lines with the water works department, to ensure timely repairs. In itself however, it is a positive sign that this



stage has been reached. The second aspect is that water practices need to be changed to prevent contamination of the drinking water between collection and consumption. Practices need to be introduced which guarantee the safe storage and handling of drinking water.

We plan to introduce a monitoring system for this purpose which would facilitate that change agents at community level can regularly review the progress being made in this field. Important, because one of our earlier findings was that although 50% of the samples taken from water sources showed contamination, at consumption point over 90% of the samples indicated contamination. It could imply that even by ensuring safe water supply, the effect on health would be minimal for the contamination that takes place in the process of collection and storage. To promote safe water practices is a necessity therefore.

The network of handpump users representatives could play a crucial role in changing water practices with outside support from the community development cell of the municipality and by using a monitoring system which would indicate to them how far they have reached.

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