Slum Networking
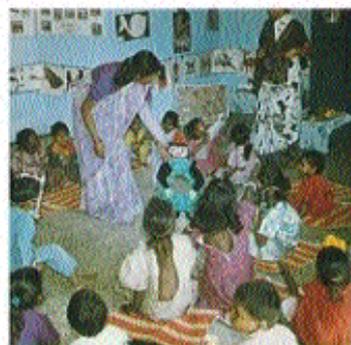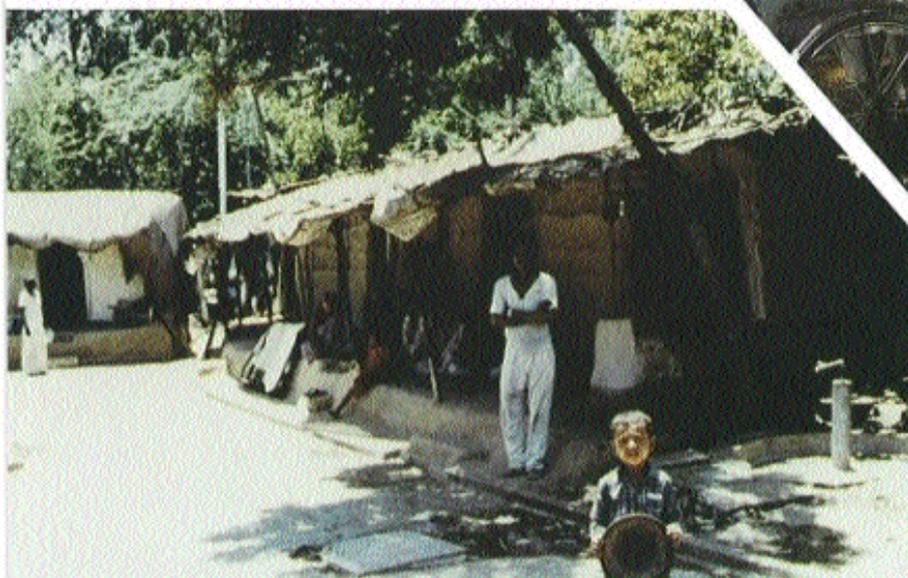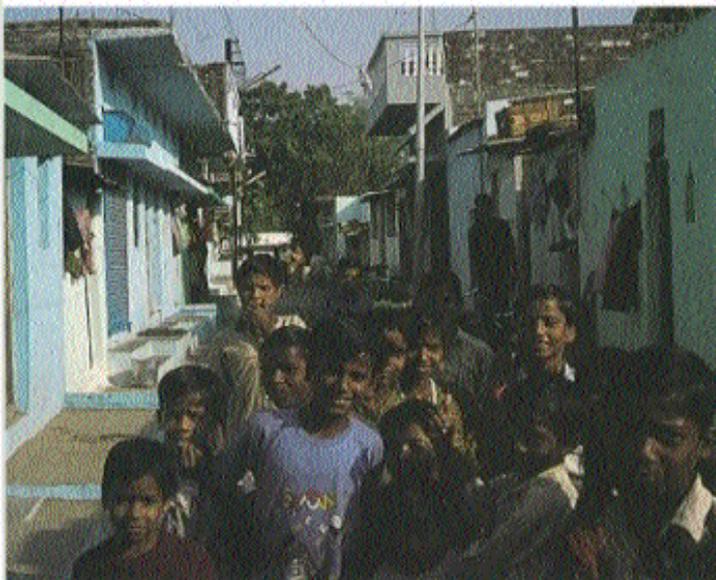
An Innovative Approach to Urban Development

BSHF

Slum Networking

An Innovative Approach to Urban Development

Contents

Foreword

It gives me great pleasure to introduce this volume on Slum Networking. Successive British Governments have long been concerned with the sustainable processes that can be adopted in the improvement of living conditions for the poorest and most marginalised groups within the cities of countries where our aid programme is assisting the local government initiatives.

Slum Networking is an innovative city-wide approach to urban improvement that enables people to help each other from the experience gained in up-grading projects. The community development runs alongside the physical works. Much of this is also innovative and can be carried out at a fraction of the cost of conventional city infrastructure development.

In this respect the British Government grant aided the first project that used the Slum Networking approach in Indore, India - a major city in the state of Madhya Pradesh with a population of 1.4 million. It is pleasing to note from this account of subsequent events that the approach is now being replicated in other cities in India - for example, Baroda and Ahmedabad - due to the success in Indore.

What is interesting to observe in this context is that the Slum Networking projects described here no longer rely on grant aid for funding. City authorities are realising the value of such work and are prepared to fund it themselves. In Ahmedabad the city's industrial enterprises are also contributing to the cost of the Slum Networking programme since they recognise that it is in their long term commercial interests for the city to eradicate slum conditions.

The story is told of the far-reaching impact of the project - health and education standards are increasing as a result of the community development programmes being carried out in the slum areas. In addition slum dwellers now have much better links into the mainstream education and health systems, which previously had not been the case. The work is a tribute to the Indore Development Authority, its Director Mr C M Dagaonkar and its Engineer Mr Himanshu H Parikh, who pioneered this approach to city development at the local level.

Although the approach does not directly fund housing improvements, this book shows that there has been a dramatic improvement in the quality of housing in the slum areas. This is due to the fact that once the area improvements have been carried out and services brought into the area, slum dwellers are prepared to invest their own limited resources, together with their time and labour, in improving their homes.

After nearly eight years as Minister for

Overseas Development I feel that this book is a fitting marker in the catalogue of successes that has shown how disadvantaged people can achieve for themselves the much needed improvements in their lives and how this has been enabled through the dedicated work of the various partners in the aid programmes in these cities.

I thank all who have been involved.

The Rt. Hon The Baroness Chalker of Wallasey
Consultant on Development,
Former Minister of Overseas Development
British Government

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Introduction

The World Habitat Awards were established in 1985 in order to identify imaginative and sustainable housing solutions around the world. The Indore Habitat Project in India won the Award in 1993 for its pioneering work in developing an innovative and successful approach to slum improvement. This Slum Networking approach was devised and pioneered in the city of Indore by Mr Himanshu H. Parikh, an eminent consulting engineer. He was also responsible for ensuring its successful transfer to other Indian cities and its long-term sustainability by bringing communities, governments, NGOs and industry together for its implementation.

This book has been produced in order to encourage the replication of the Slum Networking approach to slum improvement that was so successfully pioneered in the Indore Habitat Project. It describes in detail all elements of the approach as well as providing information on how it is being implemented in the cities of Indore, Ahmedabad and Baroda. It includes contact points for obtaining additional information on the projects and an independent assessment of the Slum Networking approach by visiting housing experts.

All too often slum dwelling is accepted as an inevitable fact of life, a problem too large to be dealt with. A blind eye and deaf ear are turned to the indignity of human beings living in subhuman conditions. Slums are seen as an eyesore and slum dwellers, at best, a nuisance. The Slum Networking approach turns this attitude upside down. The growth of slums is not seen as an inevitable part of city development. The main obstacles to slum improvement are seen to be lack of will, inappropriate priorities, inadequate institutions and unsuitable delivery mechanisms, not a lack of resources. The Slum Networking approach shows what can be achieved when these obstacles are removed. Rather than being a blight upon the city, slums provide an opportunity to improve the city as a whole. The approach also recognises the latent energy and skills of the slum dwellers and involves them in the improvement and on-going maintenance of their neighbourhoods.

The Slum Networking approach is a city-wide, community-based sanitation and environmental improvement programme. It seeks to upgrade the infrastructure of an entire city using the network of slum settlements as a starting point. The new infrastructure provided is linked to that of the existing city systems. The result is been a dramatic improvement in the city infrastructure, with a piped sanitation system, clean rivers and a much improved road network. Moreover, it has been achieved at a fraction of the cost of conventional approaches.

Physical improvements carried out within the project include a standard package of water supply, sanitation, roads and footpaths, drains, street lights and community halls. Flood control, storm drainage and environmental improvement have been achieved at low cost with innovative and simple engineering methods.

Dramatic improvements are also seen in the quality of slum dwellers' homes. These are not funded as part of the programme, but by the slum dwellers themselves. Once their neighbourhood has been improved they are prepared to invest their own resources in improving their dwelling.

The Slum Networking approach recognises that physical improvements alone are not sufficient to achieve a long-lasting impact on slum dwellers' lives. Educational, health and livelihood programmes are included alongside the physical improvement programme. Health and literacy standards are steadily increasing and the slum dwellers are better integrated into the state health and educational systems.

The Indore Habitat Project was supported by the British Government with funding and technological support from the Overseas Development Administration. The success of this initial project however has showed that the approach is widely capable of adaptation and replication to meet similar needs in other cities. It has since been successively adapted and over a period of eight years has matured into a holistic and lasting strategy that can be replicated on a mass scale. Its success is so self-evident that other Indian cities are increasingly prepared to fund the work themselves and the reliance upon grant aid to carry out the improvements is now minimal.

In November 1995, a study visit to the Indore Slum Networking project was organised to enable representatives of other developing countries to learn from the successful approach being implemented. All those attending the visit derived tremendous inspiration from what they saw, as well as new ideas for dealing with the problems generated by overburdened city infrastructures. The Building and Social Housing Foundation extends its most sincere thanks to the co-sponsors of the study visit - the Overseas Development Administration of the British Government, The Indore Development Authority and the Municipality of Indore.

The book draws heavily on documentation prepared by Mr Himanshu H. Parikh, initiator of the Slum Networking approach and project consultant. His assistance in the production of this book is much appreciated, together with that of Mr C. M. Dagaonkar, Director of the Indore Development Authority, for supplying the latest figures on the project impact in Indore.

The experience in Indore and other cities shows that the problems of overburdened city infrastructures can be solved. It shows that creating safe, healthy and productive human settlements begins at the neighbourhood or community level. It begins with people, working together with government support and encouragement, to improve their own environment. This book is dedicated to all those, who by their vision, hard work and commitment, have brought this solution into being.

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1 Urbanisation and slum housing in India

1.1 Population increase and urbanisation

Rapid urbanisation is a feature of most developing countries. In India, as elsewhere, this has led to an merciless deterioration in the quality of life. In India 28 per cent of the population currently lives in urban areas, by the year 2001 this will be 30.5 per cent and in thirty years time it will be 42 per cent, i.e. one and a half times the present population. The stresses arising from this pressure are already evident in the collapsing urban infrastructure, environmental degradation, the rapid growth of slums and an increasing disparity between rich and poor.

The population of India currently stands at 921 million and at an annual simple rate of increase of 1.9 per cent will soon exceed that of China. The population growth rate is much higher in urban areas (4 per cent) than in rural areas (1.15 per cent). This is partly due to natural population increase and partly to in-migration from the surrounding countryside. This in-migration is fuelled by the attraction of the better employment and education opportunities in the cities and is compounded by the increasing scarcity of land and resources in the countryside, which push rural dwellers to the cities. The destination for the vast majority of these migrants are existing slum colonies, where living is comparatively cheap and accessible.

Figure 1   Urban and rural population levels in India for 1991 and the year 2001 (projected)
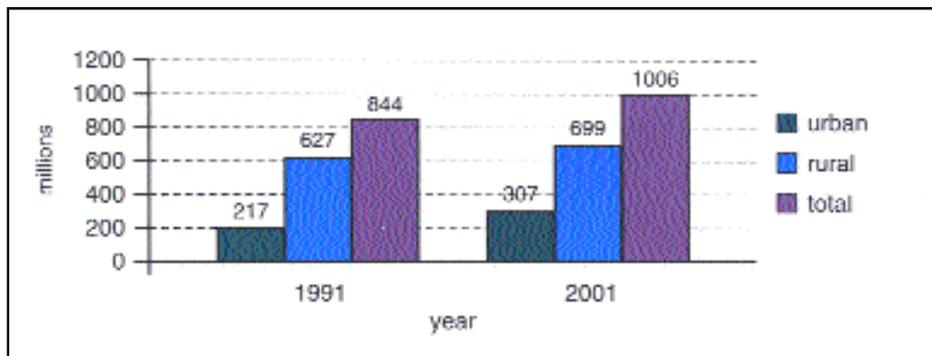
Source: Eight National Plan (1992-97), Government of India and Provisional Population Census of India,1991

1.2   Growth of slums

Slum colonies have become an inseparable part of India's urban centres and in most cities with more than a million inhabitants, over one in four people are living in such settlements. Thirty years ago such settlements were comparatively rare. Almost all of the population increase in the last decade has been in the slum areas and officially sanctioned housing provision has been unable to cope with this rate of growth. In Delhi for instance, 4 million people out of a total population of 10 million live in slums. This increases by 40,000 new families every year, of whom the state can at best absorb 10,000 with its slum rehabilitation and upgrading programmes. The real crises are posed by the accelerating growth of Indian slums and the increasing divergence of the living standards of the rich and the poor. There are many extremely wealthy people in India and yet whole families still live on Rs. 500 per month (£8.75), a sum that would have been considered very low ten years ago.

Population in the slum areas of Indian cities is growing at between 9 and 10 per cent a year, compared to the national average for urban areas of 4 per cent as shown below. At this rate the slum population will double every ten years, mostly as a result of in-migration. Currently 27 per cent of the urban population lives in slums. In thirty years time this will increase to over 60 per cent. However, in some cities the slum population is much higher. In Bombay, for example, 60 per cent of the population at present lives in slums and this figure is likely to increase to eighty per cent in thirty years time.

Slum colonies fall into two main categories. Firstly, unauthorised settlements on public or private land and secondly unregulated settlements formed by the sub-division and sale for housing of private land (although without reference to official planning and building regulations). The majority of development, in both cases, is initiated by land-dealers who do not own the land but who reach agreements with the authorities that sub-divisions will be tolerated and eventually provided with services. In the unauthorised settlements slum dwellers have no legal right

Figure 2   Population growth rates in India
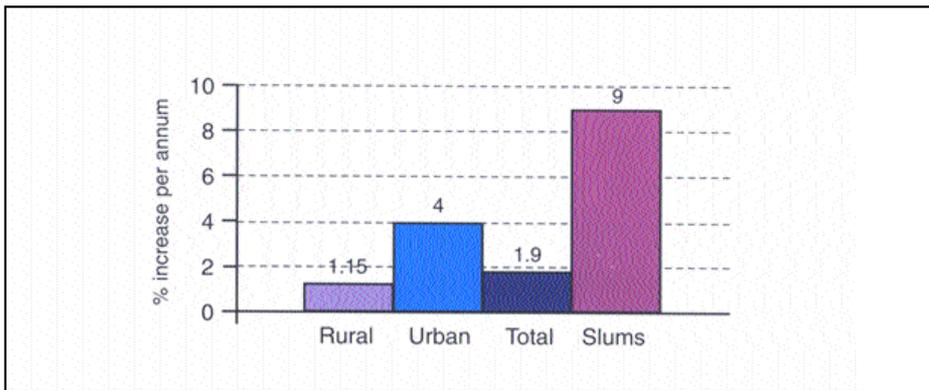
Source: Slum Networking - A Community-based Sanitation and environmental Programme: Experiences of Indore, Baroda and Ahmedabad

to occupy the land and could be evicted or have their houses demolished. If the government legally recognises such a settlement then the slum dwellers have some legal standing although no official claim on their plots. In the unregulated settlements the slum dwellers normally hold documents showing they have legally purchased their plots. This means that they cannot be deprived of their land but their houses could still be demolished because there was no official sanction for the development of the land.

1.3   Slum living conditions

Although slum dwellers account for 27 per cent of the population they only occupy 5 per cent of the urban land area. Unimproved slums are characterised by overcrowding, dilapidated structures, unhygenic conditions, grossly inadequate basic amenities, unplanned layouts and poor accessibility. Many colonies have existed in this condition for twenty years or more, becoming progressively more overcrowded as time goes by. Boxes 1 and 2 below describe typical slum conditions - the house and the slum colony of a lady named SusheelaI living in Cement Line in Bangalore[1].

Box 2   The house in the slum

The house consists of one room no bigger then three by three metres. The entrance, which can hardly be called a door, is constructed of planks and palm leaves and cannot be locked. In the corner, beside the entrance, a small kitchen area has been created with a stove, some kitchen utilities and a couple of vessels. Susheela replenishes her stock of fuel, which is piled next to the stove, with some coconut shells she found while waste-picking that morning. The floor consists of a mixture of cowdung and mud which, when regularly daubed and dried, forms an ideal substance. It can be swept easily and provides protection from the damp in the rainy season. Besides, both cowdung and mud are free, which is very important for families who live in these circumstances. On the wall some pictures of her favourite gods are hanging including the image of Lord Ganesh, the god of prosperity and fertility. There are no beds in the room: Susheela and her family sleep on pai ("mats made of straw") and cover themselves, when necessary, with some rags. These are hanging next to some reserve clothes on a rope which is stretched out in one of the corners.

Box 1   The Slum

It is a small slum which consists of two small alleys which are built up with houses packed close to each other on either side and which have no front or back yard. From the alley, which measures no more than two metres wide, you enter directly into the one-room houses where whole families live. On their doorsteps some women clean vessels, clean vegetables or wash their clothes. The water they use and the leftovers from the vegetables go into a small gutter in the middle of the alley. In this same gutter children not only play but also relieve themselves. Because of the small size of the houses most of the activities of the slum take place in these two alleys which form what might be termed the "heart" of the Cement Line.

In India, as elsewhere, economic growth is closely associated with the level of urbanisation. The 28 per cent of the population currently living in urban areas produce over 50 per cent of the national wealth. Urban areas are thus engines of economic growth and development and their efficient functioning is of great importance. Urban growth is however outstripping the capacity of the infrastructure to support a functioning city and thus reducing the productivity of the city. The desired aim is therefore to harness the urbanisation process, retaining the benefits but eradicating the inhuman living conditions associated with it.

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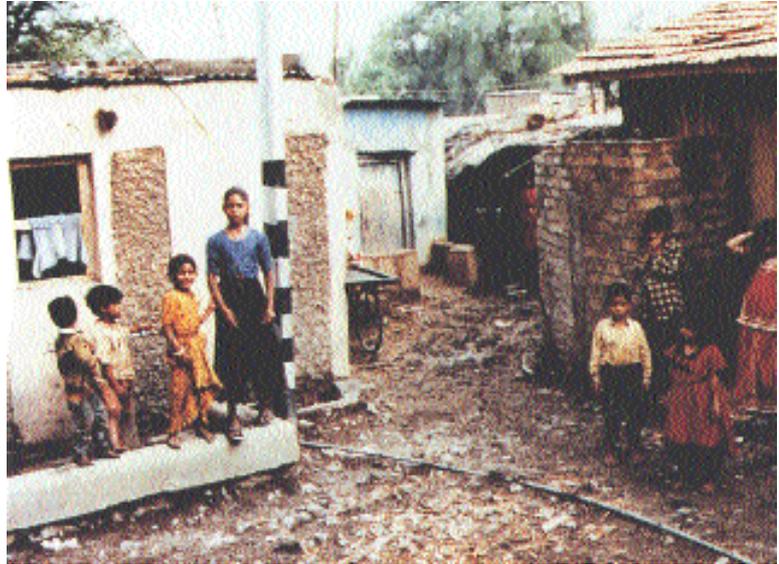
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Every ten years the slum population of India doubles. Unimproved slums are characterised by overcrowding, dilapidated structures, unhygenic conditions, grossly inadequate basic amenities, unplanned layouts and poor accessibility. The number of people living in slum areas of Indian cities is growing by 9.0 per cent a year, compared tp 4.0 per cent in urban areas and 1.9 per cent in India as a whole.

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1.4 Approaches to slum improvement

One of the methods often used to try and limit the slum explosion has been to prevent people migrating to the cities, using a variety of incentives and deterrents. These have proved futile and the flood to the city continues unabated.

A variety of approaches have been used over time to try and eradicate the slums. These fall broadly into three categories:

a) Slum redevelopment schemes

These involve the clearance of existing dwellings and structures after moving the slum dwellers to an interim 'camp'. Five or six storey flats are then built on the site and the people moved back. There are many problems associated with this approach, including high capital and maintenance costs, a high incidence of resale by the dwellers and the destruction of a community structure established over many years.

b) Legalisation of unauthorised colonies

The main feature of this type of scheme is the legalisation of the settlement. With the security of legal tenure the dwellers themselves usually carry out improvement works themselves at their own cost.

c) Slum Improvement or Upgrading Programmes

These are primarily infrastructure providing programmes, no relocation is involved and the works are carried out with the dwellers in situ. The dwellers are still regarded as occupiers though, even after improvements are complete. However, in some cases, security of tenure is also built into the programmes.

Clearance of slums and rehousing the occupants in new blocks of flats was the original way in which the Indian government attempted to provide improved living conditions for urban slum dwellers. Limitations of space and funding meant that this approach could only deal with a small part of the problem and the new flats provided rapidly became slums in their turn, as overcrowding swamped the accommodation provided. Socially and physically slum clearances were a failure. There has been a gradual shift over the last ten years to upgrading and assimilation policies.

There is a greater awareness in India today of the growing problems of the urban poor and the deterioration in urban environment and infrastructure. As in many other developing countries, the Indian government has not been able to meet the nation's housing needs. In recent years it has moved from the role of provider to that of enabler and has carried out enabling measures such as the improvement of urban infrastructure, the development of serviced land, easing of administrative, financial and legal constraints on self-help housing provision and implementation of socio-economic programmes for the urban poor. Upgrading and assimilation of slums are seen now as the most appropriate way of improving the living conditions of slum dwellers, with an increasing realisation of the value of community involvement in the process.

The urban poor are the people who know most about urban poverty but until recently played only the passive role of beneficiary in any slum improvement programme, acting as 'beneficiaries' rather than partners in the process to improve their living conditions.

The advantages of involving the slum communities as active participants in the improvement process, rather than simply as beneficiaries, are increasingly being recognised. Indeed in 1991 the Government of India launched a far-reaching programme of Urban Basic Services for the Poor (UBSP) with the aim of improving the quality of life for the urban poor. This

programme brought together a wide range of individual programmes dealing with the physical, social and economic aspects of poverty but with the difference that it aims to organise these on the basis of community involvement throughout. The programme will have more teeth due to a recent change to the Constitution (74th Amendment) which devolves decision-making power to ward-level committees. Under this approach the communities assess their own needs, initiate development and are active partners in the development process. Related government programmes are integrated into the programme, thus maximising the benefits that can be achieved. Even greater benefits could be achieved if the state government poverty alleviation programmes were also incorporated.

Slum networking ties in very well with the UBSP programme which has a similar emphasis upon an integrated holistic approach and the role and value of community involvement. The 8th National Plan (1992-1997) clearly sees urbanisation and infrastructure deficiencies as issues of serious concern and has specific chapters devoted to Urban Development, Housing Water Supply and Sanitation. It recognises the strong linkages between the physical infrastructural environmental, social health, urban poverty and degradation. Rs. 1,000 million (£17.5 million) was allocated to the UBSP programme.

1.5 General guidance for infrastructure provision in slums

All too often misguided and ineffective approaches are used to improve slums, with the result that much effort and resources are wasted in providing piecemeal, short-term solutions that soon fail because they are poorly designed, planned and executed. The following guidance can be applied to all slum improvement programmes not just those using the slum networking methods.

● Design infrastructure networks to ensure that basic services reach the entire population in an equitable manner.

● Infrastructure networks must be easy to maintain, repair and upgrade.

● Avoid wasteful overlaps and uncoordinated services by using an integrated and holistic approach to design.

● Ensure that the design makes provision for future growth and expansion of the slum.

● Do not use short-term measures to save money e.g. the provision of community toilets is wasted investment when income levels in the slum become higher. (In any case they are rarely used or maintained).

● Provide flexibility to enable upgrading when the resources of the slum dwellers increase e.g. by making provision for private toilets and house-to house water supply, the slum dwellers are able to invest in the option when they can afford it.

● The success of a project depends on the information available to those designing it. Data banks and drawing archives must be established prior

to design so as to ascertain need and existing provision, as well as the physical conditions of the site.

● Professionalism is needed in all aspects of the work carried out, since slum upgrading is more complex to plan and implement than conventional engineering projects.

● Consult with the slum dwellers closely in order to obtain a better understanding of their needs and lifestyle. This enables a clearer idea of needs to be established, as well as preparing communities for the changes to come and increasing willingness to pay for and maintain the systems.

● Use appropriate and innovative technologies. For example, conventional expensive brick manholes will not work in the narrow and twisting lanes of the slum, but small earthenware chambers can be used instead.

● Set realistic standards and workable specifications. For example, there is no point in designing a water supply system for an ideal consumption of 250 litres per capita per day, which is unlikely ever to be achieved and which will only result in expensive water supply systems and dry sewer runs.

● Balance the standards adopted with affordability.

● The costs of infrastructure systems need to be assessed on the basis of both the capital costs and continuing maintenance. Looking at capital costs only can produce a deceptive picture. For example, the cost of public latrines appears low if only the capital cost is considered but once maintenance costs are included a different picture emerges.

● Co-ordinating the roads, storm drainage

and sewerage to natural gradients results in economy and improved function. Simple and inexpensive topography management measures such as cut and fill, site grading and appropriate landscaping ensure that gravity based services operate efficiently. In following the principles outlined above, innovative methods have been developed in the Slum Networking approach to slum improvement.

[1] Marijk Huysman, Environment and Urbanisation Vol. 6, No , October 1994, pp 155-194

2 The Slum Networking approach to urban development

The idea of Slum Networking was conceived and developed by Mr Himanshu Parikh, a consultant engineer based in Ahmedabad. The approach was initially implemented in Indore where it was highly successful and has since been adapted and developed in the two cities of Baroda and Ahmedabad. All too often it is taken for granted that the growth of slums is inevitable and the scale of the problem is too large to be dealt with. Mr Parikh is convinced that there is no need to have slums in India and that India has more than adequate resources to deal with the slums. He sees no good reason why India could not be a slum-free country in ten years' time.

Lack of will, inappropriate priorities, inadequate institutions and inappropriate delivery mechanisms are the main impediments to improvement, not the lack of resources. The success of the Slum Networking approach shows what can be achieved when these impediments are eliminated and the slums themselves are seen as a catalyst for positive urban transformation and a resource which can be used for the benefit of both slums and city.

Slum Networking is an integrated upgrading of an entire city using the urban net of slum settlements as a starting point. More importantly, this net coincides with the natural water courses of a city, which also happens to be the most efficient urban infrastructure path for services like sewage, storm drainage and water supply. Slums can, therefore, be used to economically improve the city infrastructure and environment at large. It is not simply a physical solution but rather a community orientated approach to development which incorporates a range of different activities and organisations and which can work on a range of scales. Slum Networking builds upon existing good practise both in India and other countries, incorporating other development options when appropriate e.g. sites and services, land banking and slum reconstruction. It also includes unconventional concepts such as topography management, earth regradation and constructive landscaping.

2.1 Main features of the Slum Networking approach

As a result of the Slum Networking approach being carried out in the city of Indore, the slum matrix of the city has been upgraded with high quality environmental and sanitation improvements. This has brought direct benefit to 450,000 slum dwellers and to a further 450,000 slum people in the city who benefit from city-wide improvements. The associated health, education and income generation programmes have led to considerable improvements in these areas - the frequency of epidemics has dramatically reduced, many slums are heading towards full literacy and incomes have increased.

The five main features of the Slum Networking approach are

- Holistic approach in an entire city
- Costs are reduced significantly
- Substantial human and material resources are mobilised
- Community responsibility and control are increased
- Overall quality of life is improved with a range of physical, educational, health and income generation improvements

● Holistic approach in an entire city

Slum Networking is an holistic approach to urban improvement in which the slums are seen as an integral part of the city. Due to their contiguity and location on the water courses of the city the slums form a network which present an opportunity for change, rather than a problem for the city.

The approach does not aim to find solutions exclusively for the slum areas of a city but rather to integrate the slums and the wealthier areas of the city and provide a better infrastructure and quality of life for both. The new infrastructure provided in the individual slums is linked to that of other slums and to the existing city systems in order to bring about significant improvements to the city as a whole. This creates the opportunity for improvements to be carried out which would have been impossible otherwise. For example, it would not be possible to clean a city's rivers unless the discharge from hundreds of gutters in the slum areas was first sewered in closed pipes. Until 1991 Indore, like 80 per cent of cities in India, had no underground sewerage to speak of. As a by-product of Slum Networking the city now has a

primary sewerage network which serves not only the slums, but the entire city. By providing decent roads within and on the perimeter of slum areas it becomes possible to complete linkages within the city's road network. This provides a substantially better road system at comparatively little cost and would normally be inconceivable in view of the disruption, costs and non-availability of land.

● Costs are reduced significantly

Working at the larger scale enables solutions which are uneconomic at the local level to become economic. For example, a study in Indore showed that the cost of underground sewerage and centralised treatment under the Slum Networking approach was Rs. 1,500 (£26) per slum family for the on-site provisions and Rs. 1,000 (£18) for the off-site collection and treatment. This total cost of Rs. 2,500 (£44) is the same as that of a shared UNDP twin pit latrine but the advantages are considerably greater, i.e. all families have individual facilities and a much cleaner living environment is created. The grey waters from kitchens and bathrooms are also dealt with, unlike the UNDP toilets approach.

The piped sewerage system can also be extended to dwellings in the non-slum areas of the city at only the cost of connection, thus bringing city-wide improvements at marginal cost. Since there is very little existing infrastructure in the slum areas it is possible to install a range of services without having to repeatedly dig up roads. Duplication is avoided and a comprehensive linking of the infrastructure can be planned and carried out. When extended to the entire city, the compound savings are substantial.

Slums typically cover only 5 per cent of the land area of a city, although they house 27 per cent of its population. It is thus possible to have a massive impact on the city and its infrastructure by working only in these very small areas. Concentrating

resources in these neediest areas is thus very cost effective.

● Substantial human and material resources are mobilised

Resources come into play under the Slum Networking approach which could not normally be tapped. These are from the private sector who are willing to pay for an improved city infrastructure and living environment, and from the slum dwellers themselves. The resources which the poor can marshal are greatly underestimated and experience has shown that once families feel they have security (not necessarily title to the land) and believe that their locality is going to improve over time, they will invest large sums in housing and services. The money is generally raised by the sale of land or other property in their village, sale of jewellery, borrowing from friends or family or even from money lenders. It is not uncommon for families to spend up to Rs. 10,000 (£175) on improving their homes.

Once the upper income groups realise that the benefits of slum upgrading has a positive impact on their own lifestyle, there is greater willingness to cross-subsidise the improvement work in the poorer parts of their city.

● Community responsibility and control are increased

Strong community groups are needed for this approach to succeed, since it can only work with the active co-operation and participation of the slum dwellers. Direct involvement in the development process increases the public willingness to look after and sustain the assets created, thus avoiding the lack of aftercare which has proved to be one of the major stumbling blocks to slum improvement programmes in the past.

NGOs play an important part in motivating the communities involved, mobilising resources from the slum dwellers and co-ordinating the inputs from the local government and local business with the activities of the slum dwellers. Health, educational and income generation programmes are developed using the same mechanisms for community interaction.

● Overall quality of life is improved with a range of physical, educational, health and income generation improvements

The use of innovative physical upgrading methods means that the perennial problems of flooding and waterlogging in the slums can be eradicated, as can the need for open drains and filthy communal toilet blocks. Roads and paths are passable in all seasons.

Physical upgrading cannot of itself improve the overall quality of life in any sustainable manner unless the economic, social, educational and health conditions of the people also change. Although the value of community development programmes alongside the physical work is recognised, it rarely happens in practice due to lack of co-ordinating mechanisms. In Slum Networking this problem is avoided since the community is actively involved in the planning and carrying out of the physical improvements.

The slum dwellers make a valuable contribution to urban productivity and yet suffer the greatest deprivation. Slum Networking automatically gives a high priority to meeting their needs.

The logistics of the Slum Networking approach are detailed below, both for physical improvements and the community development aspects. The organisational and financial aspects are also described, together with the need for long-term

continuity.

2.2 Physical improvements in the Slum Networking approach

Most slums have little or no physical infrastructure. Roads, water supply, sanitation, storm drainage, solid waste disposal, streetlighting, pavings and landscaping are rarely present. The lack of infrastructure causes severe environmental and sanitation problems for the slum dwellers. Many slums have developed on low lying land and flood in the monsoon season. Pools of stagnant water provide breeding sites for mosquitoes and flies. Not surprisingly slums become the centres for epidemics of cholera, typhoid and malaria. Unpaved roads and open gutters make access difficult, particularly when it rains. Water supply is inadequate and often contaminated and poor sanitation facilities lead to the use of streets for defecation. Even in government improved slums conditions are far from satisfactory since work is often carried out in an unplanned and shoddy manner. Interviews with slum dwellers show repeatedly that their priorities are adequate water supply, better sanitation, storm drainage and paved access to their home.

Figure 3 clearly shows the strong association between slums and the water courses of the city. These water courses are known as "nallas" and are either man-made (open drains, large storm drains) or natural. The nallas form the natural disposal system of the city and slums are thus situated on the best gravity paths nature can provide. By using this natural infrastructure the need for expensive technology, e.g. pumping stations, is considerably reduced.

Figure 3   **Association of slums and water courses**
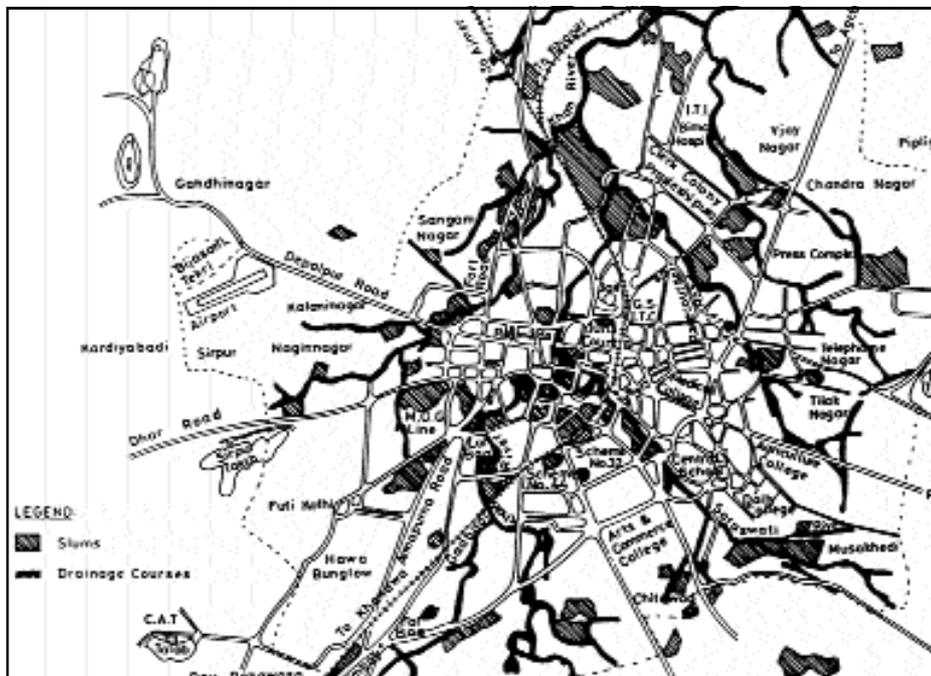
Source: Slum Networking - A Community-based Sanitation and environmental Programme: Experiences of Indore, Baroda and Ahmedabad H.H. Parikh, 1995

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Site topography plays a crucial role in the gravity-based services and it is cheaper and easier if roads, storm drainage and sewerage are co-ordinated wherever possible. Grading, landscaping, cut and fill are inexpensive and effective measures for topography management and most importantly, ones in which the community can participate directly.

Short term solutions which are not amenable to change are avoided in the Slum Networking approach. In many other slum upgrading projects cosmetic measures such as community toilets, public standposts, open gutters and cheap paving have been installed. Lack of maintenance and poor durability mean that these slums rapidly deteriorate to their original condition. There is rarely any improvement in the health of the slum dwellers since the problems of water ponding, water contamination and dealing with excreta have not been dealt with. Nor do short term solutions lend themselves to change. As the slums mature and income levels rise people aspire to higher

levels of service with individual toilets, but at this stage it is not easy to change from one system to another and the original investment is wasted.

A comprehensive range of physical improvements are included in the Slum Networking approach and these include improved roads and footpaths, storm drainage, sanitation and sewerage, water supply, streetlighting. earthworks and soft landscaping and solid waste management.

a) Roads and footpaths

Common problems associated with conventional road building practices are, firstly, that roads tend to follow the lie of the land, allowing water to pool in hollows and secondly, that roads are slightly raised above ground level which results in water running off the road to the margins. Contrary to common engineering practise, the roads in the Slum Networking approach are placed in a slight excavation wherever possible, with positive downward slopes from high points to drainage courses. This is illustrated in Figure 4 and

Figure 4   Principles of topography management
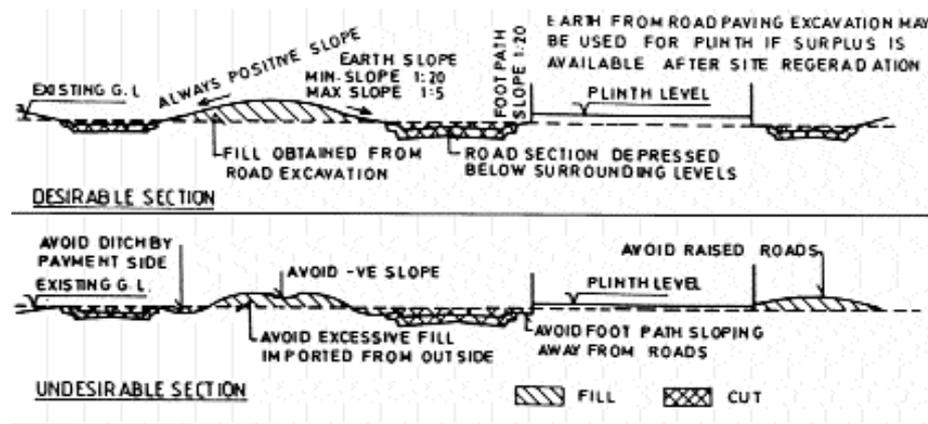
Design Principles

1.   Road section must be a depressed channel with respect to surrounding ground so that it can collect water.
2.   All roads slope positively downwards from high levels towards storm drain discharge points so there is no permanent ponding on roads.
3.   All ground levels slope positively downwards roads to avoid ditches and ponds.
4.   Fill for regrading each sector to be obtained from perimeter and internal road excavations.

Source: Slum Networking - A Community-based Sanitation and environmental Programme: Experiences of Indore, Baroda and Ahmedabad H.H. Parikh, 1995

- During periods of light rainfall the underground drains take the storm water but when there are periods of intensive rain, the road itself supplements the drains. Fewer storm drains are thus needed and smaller pipe sizes can be used since the road sections attenuate the rain peaks.

- By lowering the road, water drains onto the road from paths rather than from the raised roads into people's homes. This ensures that the slum dwellers do not have to live in permanently damp conditions throughout the monsoon season.

- Sufficient fill is generated by the excavation to infill other low-lying areas to avoid pooling and flooding.

- Savings can be made when the roads are in excavation since sub-base thickness can be reduced, as can the depths of storm drains, sewer runs and manholes.

- The expense of road filling, which can be as much as 25 per cent of the cost, can be avoided.

has the following advantages: --

It is commonly believed that rain running along a road surface damages it. This is not the case. The real damage is caused by water permanently ponding on the road surface or margins, which eventually undermines the sub-base of the road, resulting in eroding edges. 25 per cent of road building costs go to raising the roads with their associated high maintenance requirements.

Wherever possible, stone, brick or concrete roads have been used rather than asphalt. Experience has shown that concrete roads are cheaper, easier to clean and more durable than asphalt ones and the technology is such that local people are able to take part in the construction process. Expensive reinforcement can be avoided by providing movement joints. These roads become extensions of the house and people use them for sleeping at night.

The main circulation roads give the long-term structure to the settlement and these are designed to the appropriate lifespan and usage. They have the minimum widths necessary for access by emergency vehicles. All internal roads are made as narrow as possible. Kerbs are provided for all roads to prevent them crumbling at the edges and to give a longer life. The margins are graded and planted rather than paved. Their layout is informal in keeping with the organic growth of the slum and they are designed for a longer lifespan than the main roads, since they are less likely to be frequently upgraded by the authorities.

Since roads and nallas both slope positively it makes sense to lay the gravity-based sewerage system along the roads. Roads and sewers within the individual slums can therefore be inter-tuned, saving both money and time and increasing efficiency. Main sewer linkages between the individual slums follow the lines of the river banks and the other natural
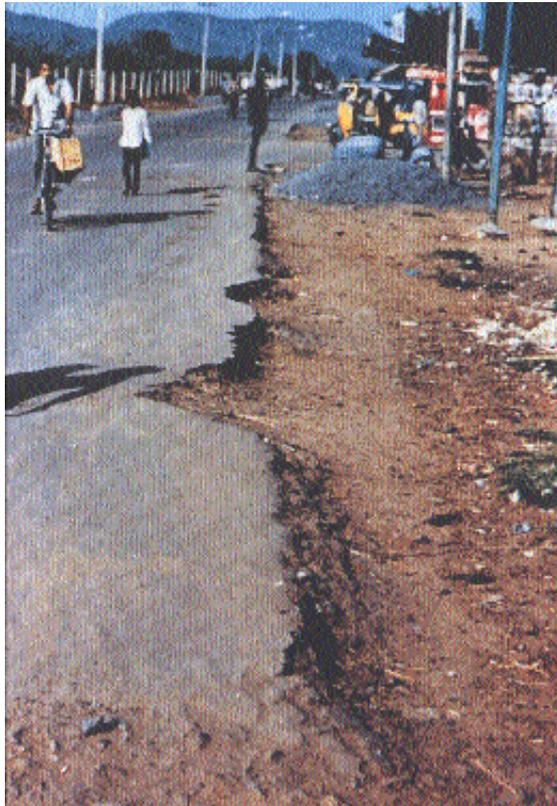
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Conventional building methods of raising roads result in rapidly eroding edges as heavy rainfall washes away the sub-base. 50 per cent of all conventional road building goes to raising the roads and maintaining them.

5

In the Slum Networking approach, roads are built in a slight excavation sloping down gently towards the drainage course. Kerbs are provided to prevent crumbling and in periods of heavy rain the roads itself acts as a drain and suffers no deterioration as a result. Costs are significantly reduced and water no longer drains into people's homes.

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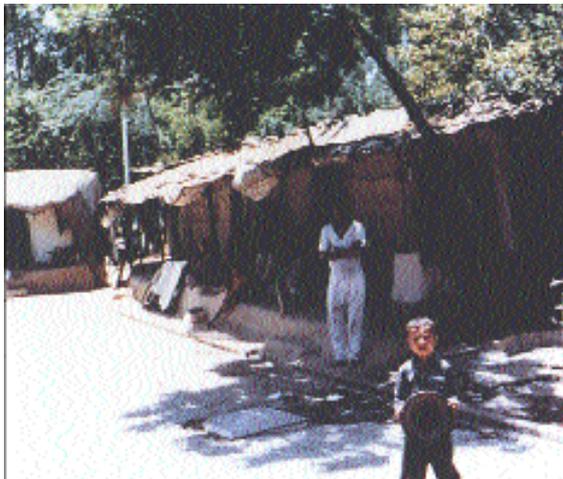
Wherever possible, stone brick or concrete roads have been used rather thn asphalt. Experiance has shown that concrete roads are cheaper to build, easier to clean and more durable than asphalt ones and the technology ois such that the local people are able to take part in hte construction process.

The majority of in-slum roads are only used by bicycles, rickshaws and pedestrians and these internal roads are made as narrow as possible. The main circulation roads are desighned to have the minimum widths necessary for access by emergency vehicles.

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Roads Have positively downward slopes from high poinrts to drainage courses and are thus able to act as storm water channels and attenuate the rain peaks.

8

b) Storm drainage

During the monsoon season the open drains typically provided in slums invariably fail as they soon become blocked by waste and sewage. Roads laid in excavation with positive downward slopes are able to carry storm water and need to be supplemented by piped drains only when the loads increase. The cost of such a system is much lower than the open masonry storm drains normally provided, which are expensive and insanitary. (See Table 1). It is also hydraulically more efficient. Not only is the cost per 100m less for piped drains, the length required is also substantially reduced since the roads themselves take over part of the function.

Table 1   Comparative cost of piped and open storm drains

Item	Piped Storm Drain (Rs per 100m)	Open Storm Drain (Rs per 100m)
Excavation	1701	1302
Pipe	17700	-
Chambers	6000	-
Concrete (1:4:8)	-	8600
Brickwork	-	14880
12mm Plaster	-	5520
Total	25,401 (£445)	30,302 (£532)

Source: Slum Networking - A Community-based Sanitation and environmental Programme: Experiences of Indore, Baroda and Ahmedabad H.H. Parikh, 1995

c) Sanitation and sewerage

Various options are available for sewerage provision and of these piped sewerage is the most acceptable due to hygiene, preference for use, maintenance costs and durability. Piped sewerage was cost effective in Indore because the slums are close together and do not require long lengths of additional pipes to connect to the main sewers. By linking sewage lines in the slums a mains network for the entire city could be developed, where previously there had been none.

Sewage lines in cities conventionally run separate from nallas and often run along the main roads. These lines need to be on a slope and therefore deeper and deeper trenches need to be dug at great expense until a pumping station becomes necessary. By placing underground sewage lines along nallas/rivers the natural gradients serve to dramatically reduce the cost of an underground system.

Piped sewerage carries both sewage and foul water in order to achieve better flows. All families are encouraged to take individual water connections so that most of the water supplied returns to the sewer lines. Realistic design standards need to be used. Water consumption of 135-250 litres per capita per day (lpcd) is assumed for urban sewerage systems but surveys carried out in the Indore slums showed this to be only 40-60 lpcd. When designing a system possible future increases in water consumption, due either to population increase or to improvements in the water supply (the city of Indore as a whole experiences a water shortage) need to be considered.

The piped sewerage system in Indore is designed in such a way that in the early stages, when there are fewer connections, the minimum cleansing velocity is maintained and yet there is sufficient capacity in the system for maximum flows. Computers are used to make the calculations required to generate optimum solutions vis-à-vis pipe diameters and the necessary slopes required in each individual settlement.

Careful design meant that pumping was avoided and expensive items such as drop manholes and vent shafts could also be omitted. Inspection chambers (which account for 30 per cent of sewerage cost) were replaced with small intercepting gully traps which were small enough to be placed at the doorstep or even inside the homes. Unlike inspection chambers, gully traps ensure that any abuse of the sewerage system by individual households results in blockages at their own doorsteps, instead of passing the problem onto the main sewerage lines. Maintenance of these gully traps is the responsibility of the individual families.

An innovative system of treating sewage is also beginning to be used as well as the more conventional treatments. Reed beds have proved themselves to be efficient cleansing systems for waste water. Waste is piped to clay or plastic-lined pits to prevent pollution of ground water. These pits are filled with sand or gravel and are planted with the indigenous plant Phragmites Australis. The roots of this reed break down the sewage and convert it into water. None of the waste enters the food chain. This root-zone method requires one square metre per person (150 ha. for Indore), which means that sewage can be treated locally rather than being pumped long distances. Initially, root-zone treatment was actively considered for Indore slums. However,

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Each dwelling is provided with an individual connection to the piped sewerage system and space to build its own toilet. Low interest loans are available for households to do so and the resulting toilets are kept in pristine condition. Having an individual toilet is increasingly a feature on the list of marriage requirements for slum families.

available to help slum dwellers pay the small connection charge and also to carry out the construction of the toilet.

d) Water supply

Where there is a reasonable water supply in the slum area it is preferable to selectively repair or upgrade the existing system rather than totally replace it. New supply needs to be installed in those areas with no previous supply. Existing hand pumps and wells should be integrated into the system wherever possible. By incorporating existing facilities it is possible for an adequate water supply to be provided at a cost of Rs. 450 (£10) per household instead of Rs. 1,000 (£18). The supply is to individual households rather than community standposts and households pay a small charge to be connected to the supply.

For new networks design needs to balance the terminal pressures, reservoir heights and pipe diameters. To achieve a more even distribution of water pressure looped networks are used in preference to branches and by integrating the slum supply into that of the rest of city some branches can be turned into loops, thus helping to equalise water pressure throughout the city and bring city-wide improvement.

for administrative reasons, the idea was dropped. The slum sewage treatment was eventually absorbed in the city level facilities planned under a newly launched National River Action Plan by the government.

A piped sewerage system enables households to have individual toilets. For the last forty years the standard sanitation solution in slums has been to build communal toilets, with the result that a lot of money is spent to provide a filthy and inadequate service. The justification for this is that slum densities are too high to find space for individual toilets but this has been shown not to be the case. Loans are

e) Earthworks and soft landscaping

These are important elements of the Slum Networking process. Landscaping is used as an engineering tool as well as helping provide a more attractive environment. After the roads have been lowered the excavated material is used to fill up low lying areas and regrade the slopes in order to drain water towards the roads and storm drains instead of ponding on site. (See Figure 4 on page 19). By grassing

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these areas clean and firm surfaces are provided at a fraction of the cost of hard paving. A grassed surface is also more efficient at absorbing water and reducing its speed of flow. It also helps prevent soil washing into the drainage system and reduces the likelihood of blockages.

The cost of roads and pavings are a major cost in slum improvement and the selective use of earth management and grassing very significantly reduces that cost. The community, with guidance, can undertake this landscaping work itself. Care needs to be taken in the selection of the species of grass planted. As well as being suited to the local soil conditions it needs to be hardy, maintenance free, quick growing, not require a lot of watering and be unpalatable to livestock.

Planting of trees and shrubs can also improve the microclimate of the slums. Trees cool the streets in summer as well as reducing the amount of dust in the air. Flowering trees and plants add beauty and those that yield fruits help to supplement the daily food needs of the families. The slum families are encouraged to plant and care for the trees outside their homes. Rather than providing conventional tree guards at a cost of Rs. 1,200 (£21) families are paid to plant and care for the trees. They are paid Rs. 50 (£0.88) when the tree is planted and Rs. 100 (£1.75) at the end of each of the first two years. After two years the tree is strong enough to fend for itself. The total cost of upkeep is thus only Rs. 250 (£4.39) and the money is retained within the slum community. Families provide their own makeshift, but effective, treeguards and a much higher survival rate is achieved for the trees.

f) Street lighting

A provision is made within the programme to provide street lighting, if it does not already exist within the slums and to repair any existing provision. The main problem in many slums is that the lines are overhead and it would be better from the point of view of safety, as well as aesthetics, if they could be underground. Although the maintenance of an underground system is cheaper it involves high initial capital outlays and resources have not been available within any project to date to put the lines underground.

g) Solid waste management

The management of solid waste in slum areas is crucial in creating a better living environment as well as providing basic hygiene. The problem of dealing with solid waste occurs widely in India and the problem is exacerbated where there are open drains. Solid waste management is a crucial urban service but often neglected, both by municipal authorities and by residents. Waste collects in side lanes or gets dumped in sewer manholes and storm drain chambers.

This element of the Slum Networking approach is the one that has been least successful to date. Insufficient resources have been allocated to it and simply providing dustbins has not been adequate. An educational programme amongst slum dwellers to separate and collect rubbish and to convince them of the health hazards of solid waste has not been very successful, and is made worse by the lack of municipal support in collecting the rubbish from collecting points as agreed. Possible future action will include allocating larger sums to waste disposal, introducing innovative technologies for recycling the waste

or using it for energy production. Waste pickers and municipal sweepers should be incorporated into the waste disposal programme and every opportunity taken to see solid waste as a potential resource instead of treating it as a nuisance.

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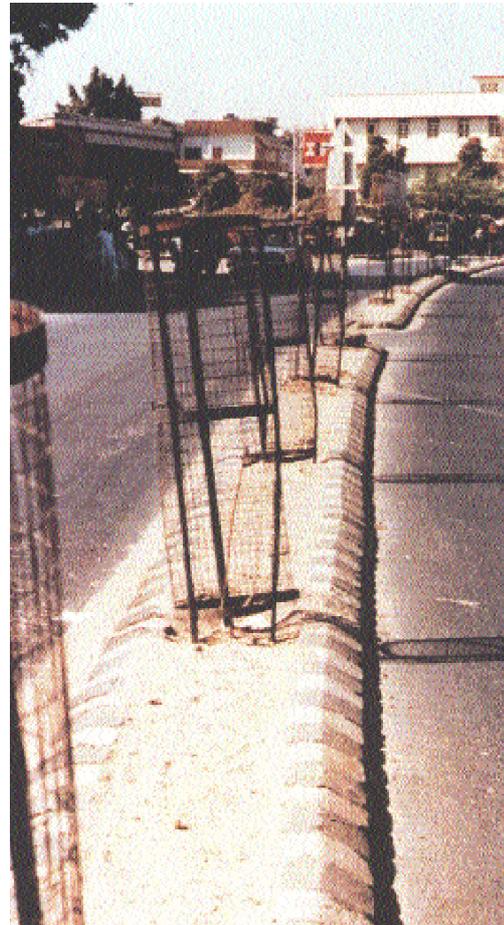
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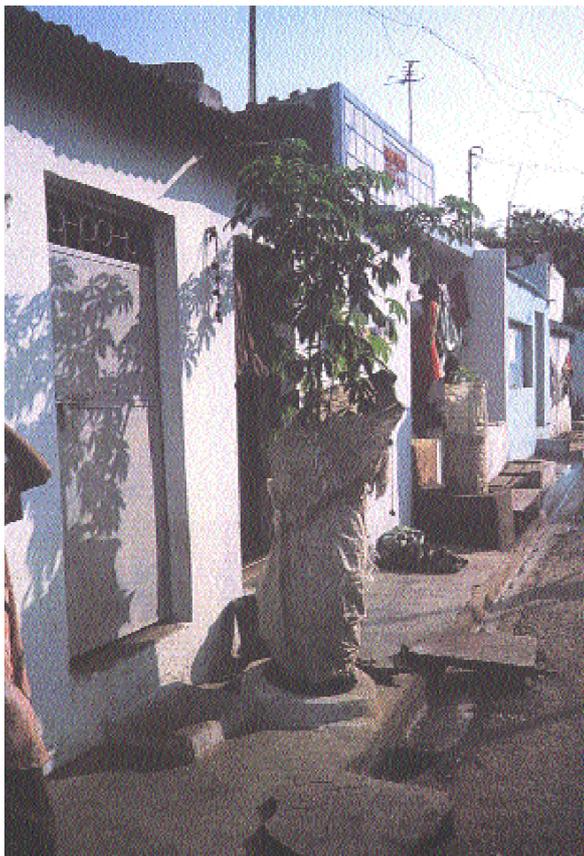
Rather than providing conventional tree guards at a cost of Rs.1,200 (£21.05), families are asked to take responsibility for the upkeep of a tree outside their dwelling. They are paid Rs.50 when the tree is planted and Rs.100 at the end of each of the first two years. The total cost of upkeep is thus only Rs.250 ($4.38) and a survival rate of over 70 per cent is achieved, compared to only 10 per cent for the more expensive municipal tree guards.

2.3 Community development

Physical improvements by themselves cannot improve the overall quality of life for slum dwellers, unless their economic, social, educational and health conditions change also. Although the concept of community development is often included in slum improvement schemes the two rarely keep in step for want of co-ordinating mechanisms. Under the Slum Networking approach such integration is assured because the approach demands the active participation of the community. Community development is a crucial aspect of the total programme since this gives the urban poor the self-confidence and the ability to plan and manage their own development.

When work in a new slum commences a baseline survey is carried out by the community development team. This identifies the number of houses, the number of people living there, income levels, health and education facilities etc. and helps to establish rapport with the people and identify their needs. Meetings are held with small groups to explain the project objectives and to identify Resident Community Volunteers (RCVs). There is one RCV per twenty families approximately, they are the spokesperson of this group of families and are the backbone of all community development activities. The RCVs are organised into Neighbourhood Committees.

These Neighbourhood Committees are involved in the planning and implementation of the project and form the link between the implementing agency and the slum dwellers. These groups are also involved in the maintenance of the project. Except for

landscaping and earthworks, most of the construction work in Indore was carried out by contractors, albeit employing the slum dwellers. In Ahmedabad and Baroda the slum dwellers themselves have played an active part in construction as well. They also manage cost recoveries on a house to house basis, thus relieving the funding institutions of this burdensome responsibility. Experience has shown that women play a more mature role in reaching consensus and resolving differences which arise in the community. They also show a greater degree of responsibility in managing money and making repayments. Special care is therefore taken to encourage the majority representation of women in Neighbourhood Committees, both in terms of numbers and positions.

Building the community hall is the first construction work that is done in every slum. This is then used as a focus to develop community involvement in the project. Initially the community halls are used as offices by the project staff for disseminating information and consulting the communities on the proposed developments. Eventually the ownership is transferred to the Neighbourhood Committee who are then responsible for its running and maintenance. The halls are designed on sound architectural principles of function, form, economy and suitability to the community characteristics. They are designed in consultation with the slum dwellers and comprise a square main hall with a pyramid roof, to which smaller rooms are attached on four sides. Ancillary facilities of WC and washbasin, staircases, stores and offices are also incorporated. Internal layouts are kept flexible to accommodate future changes of use. Variations of the basic modules allow a community to opt for the size and cost of

Community halls are provided in each in each slum as a focus for community activity. Health clinics, pre-school and non-formal education take place here regularly, as well as community meetings.

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facilities that best meet their needs.

In Slum Networking much of the community development work is focused on women and girls. This is done deliberately in order to try and stem the carryover of the disadvantages from one generation to the next. The female literacy rate is strongly correlated with a number of development indicators such as infant mortality rate, birth rate, family income. Many of the Slum Networking activities are designed to help empower women and the majority representation of women is required on all projects and groups, both in terms of numbers and the positions held. It is the women and girls in a slum community who have closest contact with the degradation and hardships of slum life. The women are more highly motivated to initiate development, not only to improve their daily lives but, more importantly for them, to improve the lot of their children.

There are five main elements of the community

- Social aspects
- Economic activities/ income generation
- Educational
- Health
- Training

development work in a slum. These are:

a) Social aspects

The social inputs into the project include

- Setting up a Neighbourhood Committee in each settlement.

- Setting up youth clubs and womens' co-operatives.

- Building community halls.
- Arranging for social activities at the community halls.

- Encouraging the groups to arrange competitions and functions both within their own area and also with the neighbouring settlements.

- Holding regular awareness programmes on various issues such as environment, solid waste management, use and maintenance of infrastructure.

- Starting physical education centres.

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b) Economic activities/income generation

Providing opportunities to increase incomes is crucial if slum dwellers are to improve their standard of living. A range of ways to do so have been established and these include

● Setting up workshops for developing vocational and entrepreneurial skills and providing counselling for the aspiring entrepreneurs to register, set up and run their own industries or business.

● Establishing community based cottage industries, especially for housewives and creating linkages with local industries and markets.

● Setting up revolving funds for giving short term loans for raw materials, machinery and establishment.

● Providing technical education scholarships to promising students in slums.

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Running a small shop is one of the many ways in which slum families earn an income. Th eshop is located next to the family's house and sells a range of fresh and prepared foods. Its custom is drawn from the other slum neighbourhood. In the larger slum neighbourhoods there are many such shops

Four training and production workshops are built, two in the first year of the project and two in the second. They are given financial support throughout the project period and it is expected that they will be self-financing after that. Two of the centres provide short courses (one to three months) in skills for which there is strong local demand. The other two centres each provide one year's training for about fifty trainees. This training is up to technical institute standards but for trainees who have only had eight rather than ten years of education.

Training is given at the community halls to women for developing the necessary skills for small income generation projects, either working at home or in small groups. Help is given in setting up co-operatives to obtain materials and market the finished products.

One revolving fund is set up in each slum. The fund amounts to Rs. 10,000 (£175) per 450 families. Individual families are able to draw an interest free loan up to a maximum of Rs. 1,000 (£17.50) each. These loans are repayable by weekly or monthly instalments over a maximum period of one year and priority is given to those who have completed a training course. Loans are for purchasing stock or equipment to start small-scale businesses. A student sponsorship programme is also established to help improve the employment opportunities for young people. This provides technical scholarships for 100 young people from the slum every year (up to a maximum of Rs. 1,200 (£21) to attend technical training institutes.
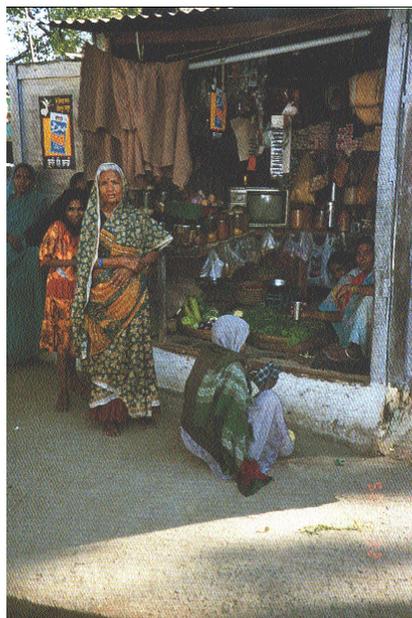
c) Education

Educational support has been included in the programme for three specific areas only and is designed to encourage better linkages between the slum dwellers and the mainstream education system. These are

- **Pre-primary education**

This is provided in order to help families understand the importance of education for their children and to provide facilities for about 60 per cent of the children in the slum in the 3-5 age group to attend a half-day nursery school. The confidence gained makes it easier for the children to attend the state primary and secondary education system which brings them into contact with non-slum children and helps them become part of mainstream urban community life. One kindergarten is established in each slum and it caters for a maximum of 50 children and is held in the community hall. Financial support is provided for three years after which time funding is taken over by state or private agencies.

- **Non-formal education**

This is provided to give back-up coaching to help slum children keep up with those in their classes from more privileged backgrounds and also provides help for those who have abandoned school under the pressure to supplement family income. These classes also take place in the community halls. Funding is available for three years and pays honoraria to teachers, contingency sums and one-off purchases of equipment.

- **Adult education**

This is aimed at improving adult literacy levels in the 15-35 age group, especially women (73 per cent of working women are illiterate). One centre is to be provided in each slum in the community

Pre-school education is provided for children aged 3-5 in slums. This helps to give the children confidence to join in the State primary and secondary education system.

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Non-formal education classes are provided in the evenings for those children who do not attend the normal day school. one of the main reasons for non-attendance is to assist the family in earning money. This eight year old girl works seven hours a day making 2 Kg of incense sticks, which will earn the family Rs. 10

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hall. The programme is run by the communities themselves with the help of the kindergarten teachers, generating volunteers, planning activities and monitoring progress. Volunteers receive basic training. Funding by the project is for three years after which it is absorbed into regular government programmes for adult literacy.

d) Health

The health programme of the project is closely linked to the existing medical provision. Training of both management and field staff is undertaken by state bodies. The programme aims to create awareness, give training and provide the basic infrastructure for

- mother and child care
- family planning
- disease detection and cure
- better health statistics

Community based workers provide these services in the slum communities. These workers are Auxiliary Nurse Midwives (one per 1000 households), Community Health Workers (one per 200 households) and dais, the traditional birth attendants. Existing curative services such as dispensaries are also upgraded to support their activities. Auxiliary Nurse Midwives are based in the community hall and the management staff are provided with mopeds. The project funds the inputs for three years in each slum. Detailed tasks for the individual components are as follows

- **Mother and child care**

Training traditional birth attendants and auxiliary nurse midwives for childbirth and also for pre/post-natal care

- Distributing folic acid, iron and deworming tablets.
- Distributing vitamin A tablets for children aged under 5.
- Conducting nutrition education classes.
- Undertaking immunisation programmes.
- Training community health workers from within the slums for day-today support and regular monitoring.
- Training mothers in the use of oral rehydration solution.

- **Family planning**
  - Conducting workshops and distributing information on alternative methods of family planning and birth spacing.

  - Counselling individual families and distributing appropriate contraceptives as necessary.

  - Encouraging permanent methods of birth control when families are complete (strictly no coercion).

- **Disease detection and cure**
  - Upgrading the three existing dispensaries in the slums and attaching an additional medical officer to each for routine health checks and for treatment of minor ailments.
  - Providing minor treatment and dispensing essential drugs with the help of auxiliary nurse midwives and community health workers.

  - Establishing linkages with local hospitals and developing systems for speedy referral of major ailments.

- **Health monitoring**
- Maintaining records and monitoring progress are crucial elements of any effective health

programme. A database is maintained enabling progress to be monitored. Monthly statistics are recorded on infant mortality, immunisation, family planning usage, frequency and nature of illness, child weights etc. These statistics are collected by the community health workers, the auxiliary nurse midwives and the field medical officers.

2.4 Organisation and finance

From the point of view of organisation, the Slum Networking approach starts with a single slum and works outwards, gradually including more and more individual slums in the programme. Thus, although the final outcome is development on a massive scale, it has all been completed at the neighbourhood level and there has been no chance of it becoming "inappropriate". The programme is developed and implemented at the city level by a specialist team working within the City Development Authority, although the detailed arrangements will vary from city to city. The organisational structures for the three cities of Indore, Baroda and Ahmedabad are set out in Chapter 3.

The basic organisational unit is the elected Neighbourhood Committee. These Committees are registered as co-operative societies or non-trading associations. They are the key element of social and community development. They handle money matters and represent the slum dwellers' interests when dealing with developers and local government. Each slum has its own Committee and an organisational network is gradually built up from these. Experience is shared between Committees

bringing valuable contacts and sharing of experience between individual slums.

The role of the state is limited to that of enabling and facilitating. For example, by removing the legal impediments to land development and the rental sector, making serviced land available and carrying out maintenance of infrastructure systems where relevant.

The success of any project depends on the database available. All Slum Networking projects are proceeded by a thorough surveying of the site to establish comprehensive data banks and drawing archives. The slum dwellers are also consulted to identify their needs and views. This is 16

Regular health checks are made on all slum children by Community Health Workers. Nutrition classes, immunisation programmes and distribution of vitamin and mineral supplements have helped to bring about a dramatic improvement in the health of children growing up in slums.

particularly important in view of the wide disparity in lifestyle of the professional and the slum dweller.

The slum dwellers themselves play a major role in the development of their habitat. They are co-financiers and therefore clients rather than beneficiaries. In Indore the financial contribution of slum families was small and often 'in kind'. In Ahmedabad and Baroda, slum dwellers are equal co-financiers. As such they have the right to be consulted on any works and find their own contractors. The Municipal Corporation may put in a bid to do the work but the final decision rests with the slum dwellers.

The Slum Networking programme covers the costs of the provision and improvement of the physical infrastructure and the community development activities for a limited period. It does not cover the cost of individual water and sewerage connections for the slum dwellers, nor for the building of individual toilets and any upgrading of the dwellings within the slum.

The infrastructure costs per family of the Slum Networking approach have been calculated at Rs. 4,200 (£74) per family. This includes the provision of a high quality environmental and sanitation programme, the main components of which are set out below in Table 2. The British Overseas Development Administration financed the first Slum Networking project in Indore to the tune of Rs. 417 million (£7,315,900). In view of the success of the programme, many slums which were previously upgraded under a more conventional World Bank programme, and which had subsequently degenerated, were also taken up. With these additional works, the cost of the project eventually increased to Rs. 600 million (£10.5 million). Subsequent projects in Baroda and Ahmedabad have not relied on overseas grant aid and in Ahmedabad the city has not required any grant aid at all and details of the funding is set out in Chapter 3.

The slum dwellers pay for and build their own toilets and pay for their own connections to water and sewerage services. All improvements done to the dwellings are done by the slum dwellers themselves - the Slum Networking approach provides only infrastructure, there is no element of housing improvement at all included in the programme.

Table 2   Cost of individual infrastructure components per family

Component	Cost (Rs.)
Roads and footpaths	1,750
Asphalt courses	250
Storm drainage	110
Sewerage	1,450
Water supply	450
Earthworks and landscaping	130
Street lighting	50
Solid waste management	10
Total cost per family	**4,200 (£73.68)**

Source: Indore Habitat Project, World Habitat Award, Final Submission 1993

Table 3   Comparitive costs of networking and conventional sewerage systems

It

Component	Slum Networking Method (Rs. million)	Conventional City System (Rs. million)
Outfall drains	60	200
Sewer mains	100	200
Distribution systems	220	400
Pumping stations	Nil	30
Capitalised pumping costs	Nil	20
TOTAL	**380**	**850**

Source: Slum Networking - A Community-Based Sanitation and Environmental Programme:
Experiences of Indore, Baroda and Ahmedabad. H. H. Parikh, 1995

has been shown time and again that the slum dwellers are willing and able to muster large amounts of money to improve their living conditions - far more than any state government could possibly afford to pay. Dwellers invest anything from Rs. 10,000-80,000 (£175 - £1,404) in their houses at one go. Aid agencies are required only to act as financial guarantors.

2.5 Long term project continuity

Long term continuity is vital in any development programme. Unless due care is given to this aspect of the project, the benefits will be only fleeting. There are two key elements in ensuring continuity. Firstly, ensuring that project personnel are adequately trained and second ensuring that structures are in place to help maintain the physical and social/community assets created during the project.

An intensive training programme is built into the Slum Networking approach to ensure that the project is fully understood by the project teams as well as by the members of the community. Unless this training is carried out the initial success of the programme would not be maintained. The training is given to the project staff, community organisers and volunteers and is an on-going process. The main aspects covered are

- Training to the trainers.
- Basic training to project officers, community organisers and volunteers.
- Refresher courses to review progress and exchange experiences.
- Monitoring workshops to review progress and prepare reports.
- Interdisciplinary team training (engineers, architects, planners, health and community development staff).

Long term continuity and maintenance of the assets created is crucial and great care needs to be taken to ensure this continuity. Involving local institutions and organisations from the very beginning in the project is crucial, since often it is they who will be taking on

responsibility, in conjunction with the community, for the assets created.

The following guidelines have been produced

- Sensitise individuals and institutions on the importance of post project maintenance of assets created.

- Fix institutional roles and responsibility for post project assets.

- Organise community support to continue into the future.

- Make financial provision, as well as infrastructure and equipment needed.

- Train personnel in post project maintenance.

- Plan for the legal transfer of assets to the agencies responsible for their maintenance.

- Ensure proper co-ordination and integration between the project staff and agencies responsible for their future maintenance.

- Strengthen the neighbourhood committees and involve them in post project maintenance.

- Identify NGOs prepared to be involved.

- Helping interested project staff involved in community development to retain a role in the community.

Further reading

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D. Diacon *Indore Habitat Project in World Habitat Awards 1990-1994*, Building and Social Housing Foundation, Coalville, 1996

M. Slingsby *Indore Habitat Improvement Project - An Integrated Approach. Shelter-Special Issue*. World Habitat Day, October 1994, HUDCO Publication, pp.37-40.

[1] Comparative Study in Indore

3 Slum Networking in Practice

Slum Networking was successfully pioneered in the Indore Habitat Project in the city of Indore and is currently being implemented in the two Indian cities of Baroda and Ahmedabad. The location of the three cities can be seen in Figure 5 below. Just recently, the city of Jodhpur has taken up Slum Networking, and approaches have been received from the cities of Bombay and Delhi to try the concept on a pilot basis. The project in Indore was launched in March 1989 by the Indore Development Authority with financial assistance from the Overseas Development Administration of the British government. Actual implementation of the project started in 1991. Against all odds and in an unimaginable short time, changes have happened in Indore City which would have previously been deemed impossible.

Figure 5 Location of Indor, Baroda, Jodhpur and Ahmedabad
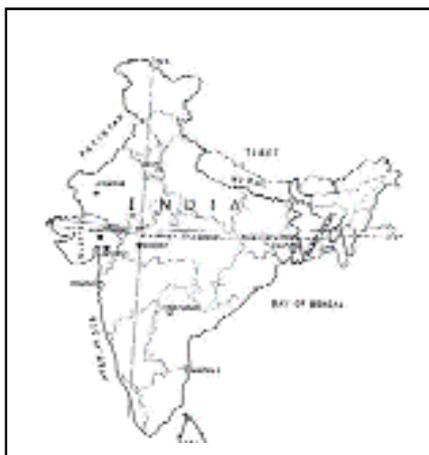
3.1   The Indore Habitat Project

a) Indore city profile

Indore is located midway between Delhi and Bombay and lies at 550 metres on the fertile Malwa plateau. It is an important textile manufacturing town of India and also has a sizeable engineering industry. Its central location makes it an important marketing and distribution centre for the region's agricultural produce.

In the last twenty years the city's population has grown rapidly from 560,000 in 1971 to 1,400,000 in 1995. Twenty-eight per cent of the population currently live in slums and this is expected to increase to thirty per cent by the year 2000. Indore is the major city in the region and exercises a great pull on the surrounding area. This has helped to account for the rapid rates of population increase experienced by the city over the last twenty years. A disproportionate amount of this growth has been in slums, where population has quadrupled, as opposed to doubled as in the city as a whole. In Indore most of the slums were either on Government lands or in unauthorised private colonies. The slum dwellers on Government lands are given "pattas' (long-term leasehold) by a State Government ordinance. The unauthorised

private colonies have now been 'authorised'.

Indore is an old city and a large number of its houses are in a dilapidated condition. Slums in Indore are characterised by overcrowding, dilapidated structures, unhygenic conditions, grossly inadequate basic amenities, unplanned layouts and poor accessibility. Over half the houses in the slum areas are classified as temporary with a further 35 per cent being semi-temporary. They generally house the poorer sections of society. A survey in 1990 showed that more than two thirds of all slum dwellers are below the poverty line, earning less than Rs. 1,000 (£18) a month. Most of the workers find work on a temporary basis only. Only two thirds of workers find work for more than 14 days a month.

The literacy rates in the slum are surprisingly high, being almost 60 per cent although there is a marked difference between the sexes, with only 47 per cent of women being literate compared to 73 per cent of men. Sickness is common and families spend about 8 per cent of their monthly income on medicine.

There is an underground sewerage system serving the city but it was built in 1936 and only serves 5 per cent of the population and covers only 10 per cent of the city area, due to the lack of a proper collection network or treatment facilities. The large population not served by the network discharges its waste into the open gutters and storm channels, which eventually discharge into the river Khan passing through the city. The river carries the major portion of the city's sewage and sullage. This results in poor environmental and health conditions for the city's inhabitants.

Figure 6   **Components of the Indore Habitat Project**
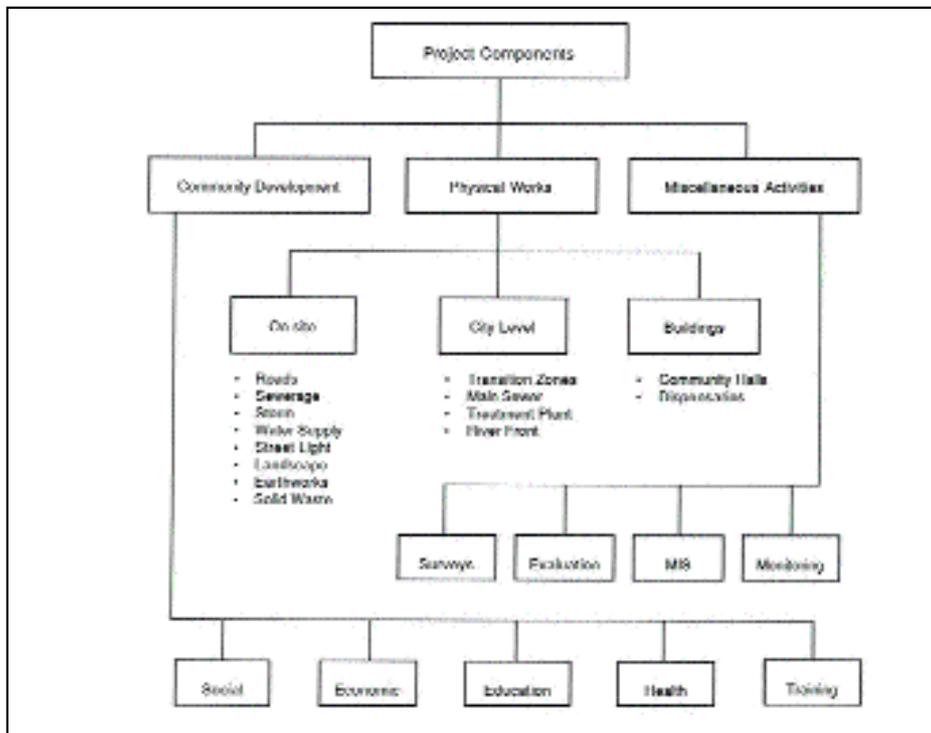
Source: Slum Networking - A Community-based Sanitation and Environmental Improvement Programme. Experiences of Indore, Baroda and Ahmedabad. H.H. Parikh, 1995

The city is short of water and plans are underway to improve this situation with a diversion of water from the River Narmada. Until this work is carried out the city will continue to suffer from intermittent supply and poor pressure. In some houses the water connections pass through open drains carrying sewage, so that when the pressures in the water lines are low during non-supply hours, sewage enters the supply pipes through leaking joints.

The works carried out under the Indore Habitat Project comprise three main components - the physical works, the community development works and the various monitoring and information gathering activities to support this. This is shown in Figure 6.

b) Information gathering

Prior to any work being carried out a thorough base-line survey was carried out to establish the basic physical and socio-economic conditions of the 161 slums. Each individual slum was surveyed and a comprehensive database built up for each. The results of the physical surveys of two of these - the Ekta Indira Nagar slum and the Musakhedi Balai Mohalla slum can be seen in Figures 7 and 8. Each individual dwelling is identified together with the function of all other dwellings in the slum. Also noted are the trees, water laps, toilet blocks, fencing, roads, waterways, washrooms and OTLAs (uncovered platforms built at the entrance or rear of the house). Dwellings are categorised as to whether they are (a) pucca building with slab, (b) sheet roofing and brick walls or (c) ordinary roof and mud walls.

The results of the physical survey showed that the total area of the Ekta Indira Nagar slum to be 58,203 m2, of this 12,561 m2 was built area (21 per cent). Of the open area 13,013 m2 (22 per cent) was road or paved area leaving 32,629 m2 as open space. This provides a measure against which the end result of the project can be measured. It also identified the perceived needs of the population and details of their willingness to pay for upgrading. Two socio-economic surveys were carried out, one a detailed sample survey of families and the other a survey of statistically selected slums to establish overall slum profiles. The survey work was undertaken by a professional operational research agency.

Following the baseline survey further surveys were planned for evaluating and monitoring the project. This work was carried out by the same agency. The need for two evaluation surveys was identified. One during the project to ensure that all was going to plan, enabling corrective action to be taken if it wasn't and the other to be carried out some time after the project is over in order to determine the longer term effects of intervention.

c) Physical improvements

183 slums are covered by the project and 22 of these had been previously upgraded under a World Bank scheme, although not to such a high standard. The physical improvements were therefore carried out only in 161 slums while the community development works took place in all 183. Subsequently 11 of the 22 slums previously improved requested they also be included in the physical work programme since girls living in slums upgraded under the Indore Habitat Project were more eligible for marriage than those not. In total 450,000 persons were included in the area covered by the project.

In each slum colony new roads were provided,

an underground sewerage system and an improved water supply system put in place using the process outlined above in Chapter Two. Most of Indore is situated on black cotton soil which is a soft and silty clay and the following precautions had to be taken to minimise damage to roads caused by soil movement

- replacement of sub-grade soil by inert material such as sand

- use of a flexible surface such as stone paving in preference to asphalt.

- Unreinforced concrete can be used so long as sufficient movement joints are provided

- provision of high cambers to allow for some settlement

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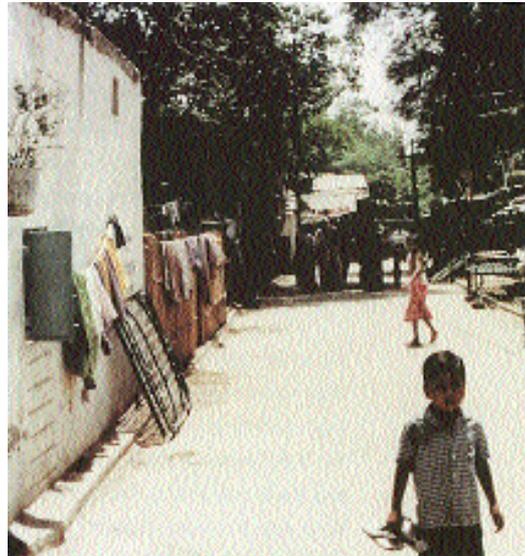
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Physical improvements carried out under the Slum Networking programme including improving roads and footpaths, providing storm drainage, sanitation and sewerage systems, water supply, street lighting, soft landscaping and solid waste management. This has been achieved in Indore at a cost of Rs. 4,200 (£73.68) per family

Figure 7   Physical survey of the Ekta Indira Nagar slum
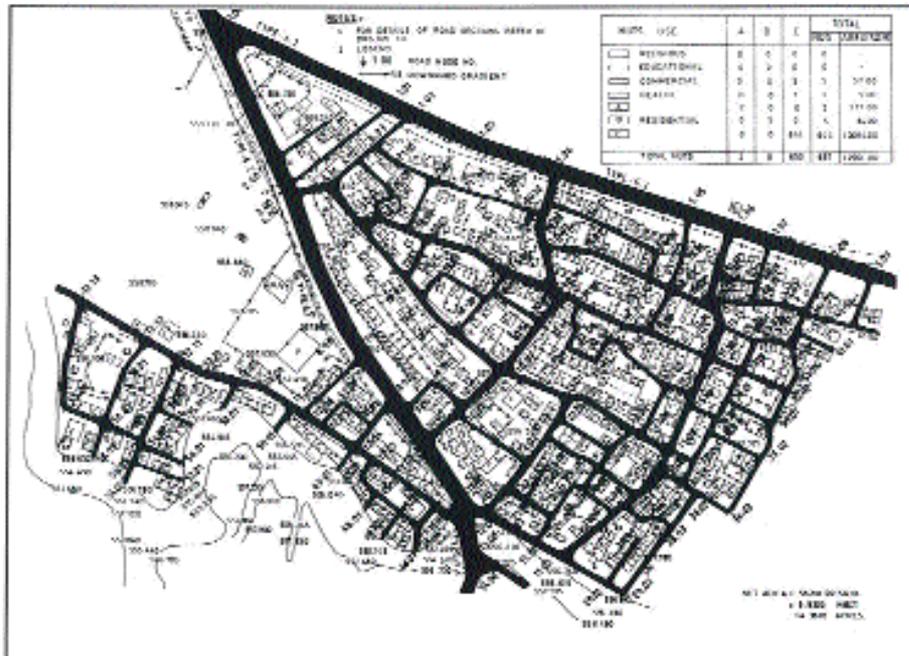
Source: Slum Networking - A Community-based Sanitation and Environmental Improvement
             Programme. Experiences of Indore, Baroda and Ahmedabad. H.H. Parikh, 1995

Figure 8   Physical survey of the Musakhedi Balai Mohalla slum
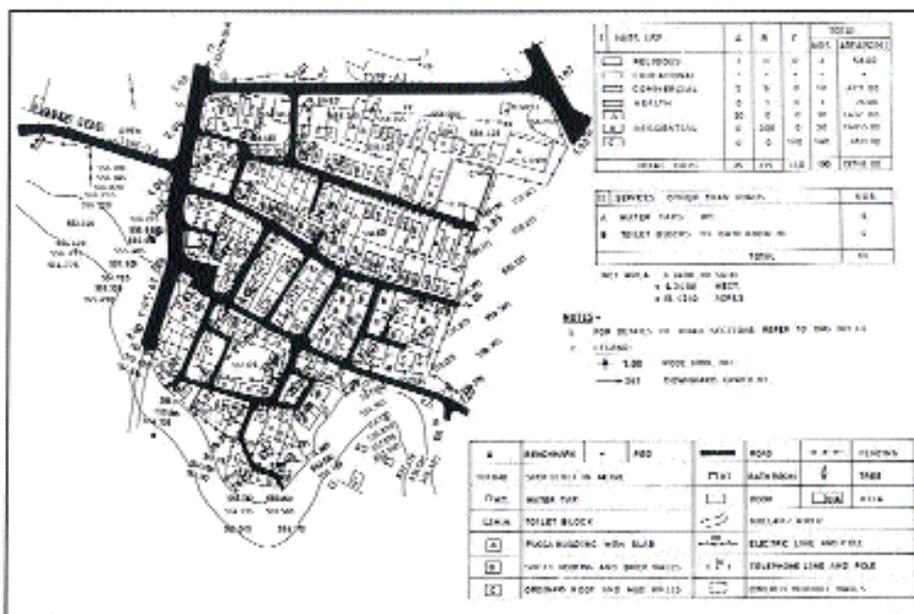
Source: Slum Networking - A Community-based Sanitation and Environmental Improvement
          Programme. Experiences of Indore, Baroda and Ahmedabad. H.H. Parikh, 1995

Table 4   The agregate impact of Slum Networking in Indore

Infrastructure item	Quantity
Total length of new roads	360 km
Total length of new sewer lines	300 km
Total length of new storm drains	50 km
Total length of new water lines	240 km
New trees planted	120,000
Total area of grassing/shrubbing	500,000 m^2
New community halls	120

Note: This shows actual rather than thoeretical impact at the slum level. 90 km of city level main
            sewers along the banks have been provided in addition to these works.

Source: Slum Networking - A Community-based Sanitation and Environmental Improvement
            Programme. Experiences of Indore, Baroda and Ahmedabad. H.H. Parikh, 1995

Although the total amount of work in each slum might be small the aggregate impact is substantial, as can be seen in Table 4 above.

d)   Community development

80 community halls have been built to date and are in use and a further 40 are under construction. Four vocational training and production workshops have been built. One health centre for primary health care has been built and a further one is planned. Three existing dispensaries have been upgraded. Wherever possible existing city facilities have been integrated into the project in preference to building new ones.

In Indore to date 79 Neighbourhood Committees (Basti Vikas Mandals) have been officially registered and have 4,788 members. These act as parent bodies to other sub-groups such as youth clubs, womens' groups etc. To date 71 womens' groups (Makila Mandals) have started with 4,706 members.

Education and health activities are developed at the same time as the physical improvements are done. At present there are 190 kindergartens in operation in 100 of Indore's slums in addition to the 79 centres set up in 26 slums under the national Integrated Child Development Scheme. As at December 1995 the pre-primary education programme had covered 60 per cent of the eligible children. (See Table 5)

For non-formal education 67 centres are at present running in 47 slums, providing assistance to 1,098 dropout children. 83 centres for adult education are active and running with the help of kindergarten teachers. So far 15,541 men and women have been

involved and in 20 slums 100 per cent literacy has been achieved. A statistical record of the progress of the health programme is kept. Data is maintained by the community itself in simple and easy to understand formats. Information is typically recorded on infant mortality, immunisation coverage, use of family planning, frequency and nature of illnesses, child weights etc. A progress report as at October 1992, i.e. in the fairly early stages of the project, can be seen below.

e) City wide impact

The slums were integrated into the city fabric through the improved road and sewerage networks. Since there are normally transition zones between the slums and the formal settlements, these are crucial areas for ensuring the assimilation of the slums into the city fabric. Particular attention was thus paid

Table 5 Pre-primary education programme in Indore

Progress with education programme	Achievement to date
Households covered	53,084
Population covered	265,425
Total children 3-5 years	20,120
Total target group	12,072
Proportion of eligible children covered	60%

Source: Slum Networking - A community-based Sanitation and Environmental Programme: Experiences of Indore, Baroda and Ahmedabad, H.H. Parikh, 1995

Table 6 Health progresss report in Indore slums

Progress with health programme	Achievement to date
Number of slums involved	121
Number of Auxiliary Nurse Midwives	41
Number of Community Health Workers	103
Population covered	265,000
Auxiliary Nurse trained mothers	9,377
Children (0-1 years)	7,428
Eligible couples	38,123

Source: Slum Networking - A community-based Sanitation and Environmental Programme: Experiences of Indore, Baroda and Ahmedabad, H.H. Parikh, 1995

to the service infrastructure and landscaping of transition zones between the slum boundaries and the surrounding higher income areas. By improving the slum areas in a way which not only draws upon the rest of the city infrastructure but also serves to improve it, shows how slum and non-slum fabrics and communities can become mutually supportive. It is estimated that 450,000 slum dwellers benefited directly from the project but that a further 450,000 citizens have also benefited.

- Roads and sewers

Out of the 360 km of roads provided in the slums, approximately 80 km on the slum peripheries were linked up at the city level to reduce the traffic congestion on the existing city trunk roads. An example of how this was achieved can be seen in Figure 9 below. Given that the natural water courses passing through cities define the ideal gravity paths and that slum colonies are located along these water courses, it has been possible to develop a piped sewerage network linking the slum colonies. These links were located along the river banks and by using larger pipe diameters than needed just for the slums, the capacity of the main sewers installed was increased sufficiently to accept the larger city load.

Thus the Slum Networking approach provides the primary sewerage for the entire city and the secondary and tertiary sewerage networks in the slums, but not in the rest of the city where people can well afford to lay their own networks. Doing this is cheaper than providing conventional on-site treatment such as septic tanks. Households are increasingly connecting to the mains network (about 90 km of sewer mains now penetrate deep into the city fabric).

Figure 9 Crating road linkages through slum networking
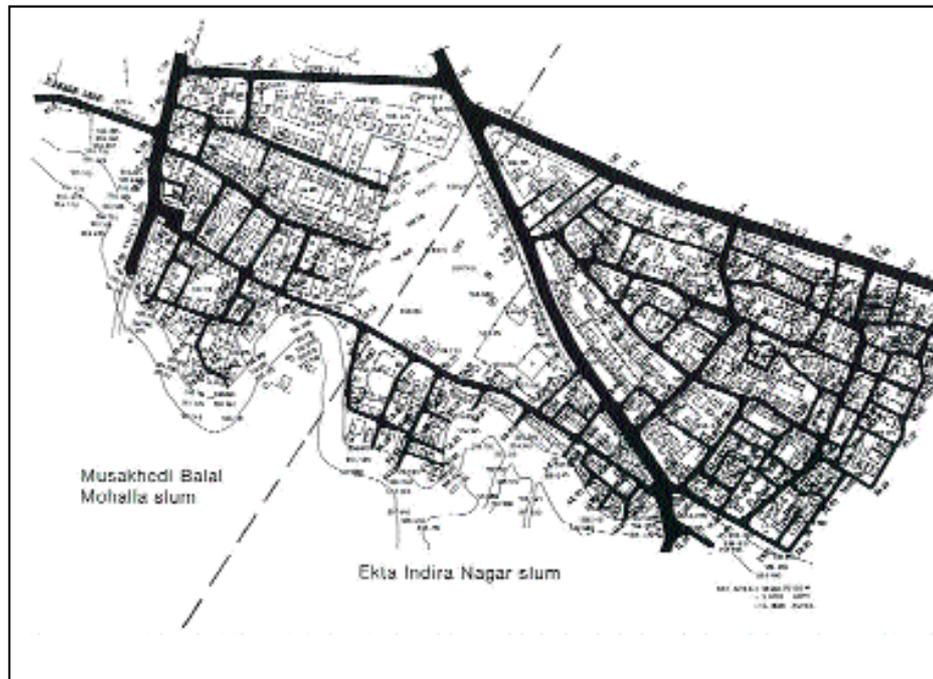
Source: Slum Networking - A community-based Sanitation and Environmental Programme: Experiences of Indore, Baroda and Ahmedabad, H.H. Parikh, 1995

A government grant is available under the National River Action Plan to help the non-slum sectors of the city and upstream areas develop distribution systems and treatment facilities. In light of the positive experience of Slum Networking, the new systems are also planned on the same topography sensitive approaches.

● River cleaning

As stretches of the rivers passing through the city centre were cleaned of sewage, they were turned into fresh water lakes and the banks were landscaped. 4 km of bank have been improved to date. Improvement of the riverbank has now become a continuous process. A further one kilometre stretch was taken up for development in 1996. The old temples and stone steps along the banks were painstakingly restored. The river bed was dredged to a grade and the surplus earth used to widen the banks. The slopes were stabilised by cutting the sides to the natural angle of soil repose and extensively planted. Stone pitching and masonry top walls were used to retain the banks where the space was too limited to permit the natural slopes. Pedestrian paths and gardens were laid on the banks. As the earthworks and landscaping stabilised short bund walls were built across the bed to retain the water. Thus in the monsoon times water flows freely over the walls but in the dry summer months water is retained in the lake formed by the bunds.

The city centre has thus been transformed into a major recreational area and in the light of this success a further stretch of the river near the temple site of Panchuyia has been similarly improved to form a beautiful and popular picnic spot for local people. Surveys have shown that groundwater quality in wells near the improved stretches of the river is now significantly better than those near stretches still to be improved.

Figure 10   Proposed and implemented riverfront improvement
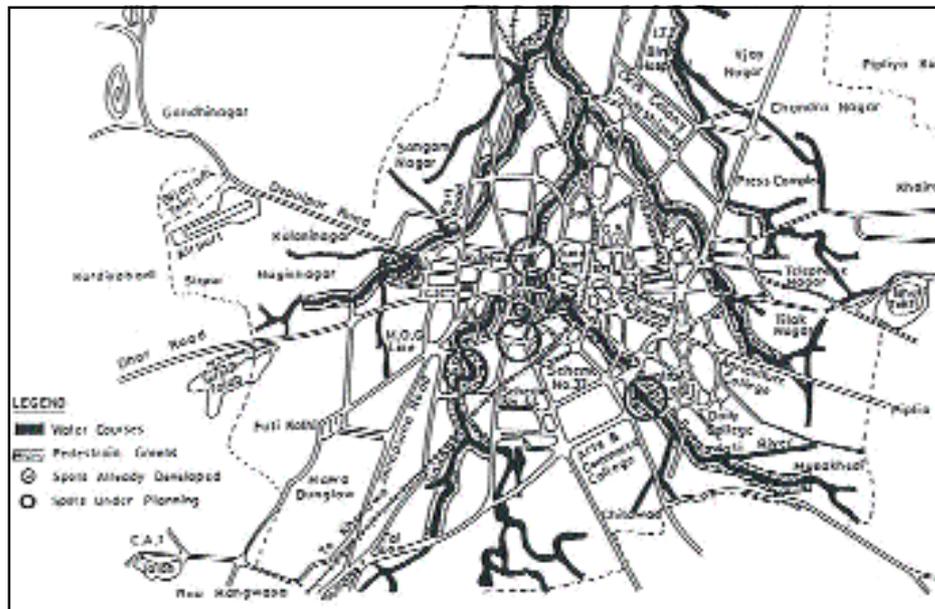
Source: Slum Networking - A Community-based Sanitation and Environmental Improvement
Programme. Experiences of Indore, Baroda and Ahmedabad. H.H. Parikh, 1995
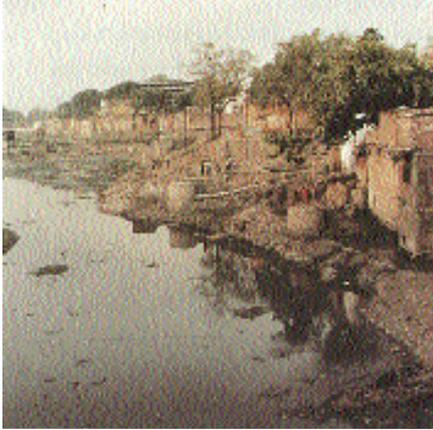
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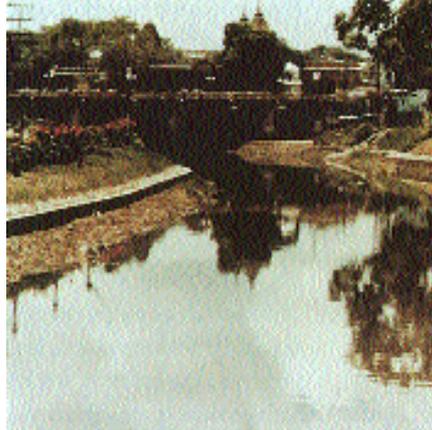
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Before and after riverbank improvement. Prior to the slum improvement programme in Indor, the river was full of sewage and was abreeding ground for flies and mosquitoes. Once the piped sewerage system was in place, it was possible to clean the rivers and make them into an attractive part of the city.

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Pedestrian paths and gardens were laid on the river banks and provide attractive walkways. Old temples and stone steps along the river have been painstakingly restored and the area is now a major recreational area of the city.

The cost of carrying out this work has been met from those wishing to provide commercial and recreational facilities on the river banks and has placed no additional financial burden on the project. Fountains and lights are being installed and maintained in the lake by industrial and commercial companies. A plan for extending the improvement of the river banks to cover the entire city has been developed, as can be seen in Figure 10.

f)   Organisation and implementation

The size and complexity of the Indore Habitat Project requires the co-operation of many different organisations. The Indore Development Authority is the main Executive Agency and has been assisted through the project by the Overseas Development Administration of the British government through its field management office in Delhi. As well as providing financial support the ODA also provided technical expertise in the development and implementation of the programme. Many public agencies were involved in the project and these included the Indore Municipal Corporation, the District Collectorate, State Ministries, Public Health Engineering, Forestry Department and the State Health and Education Departments.

Although the contribution of all these agencies is important, the project would not have been possible without the people themselves. A veritable army of community volunteers, teachers, local birth attendants, members of neighbourhood committees, youth organisations and women's co-operatives have been involved in the day to day activities required to establish and run the project. The Indore Development Authority established a project team to carry out the project in liaison with the project consultant. The structure of this team can be seen in Figure 11.

Figure 11   Indore Habitat Project Team
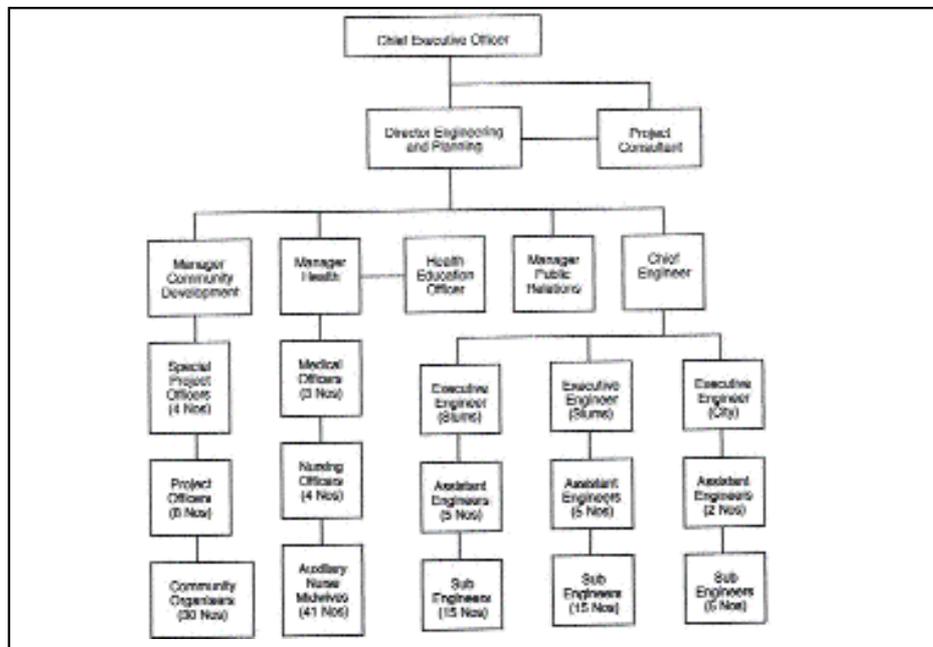
Source: Slum Networking - A Community-based Sanitation and Environmental Improvement
          Programme. Experiences of Indore, Baroda and Ahmedabad. H.H. Parikh, 1995

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g)   Monitoring and management

A management information system (MIS) was established to provide simple and clear information on all aspects of project progress. The development of the MIS was carefully planned in order that it provide the required information at an appropriate level of detail and frequency. Once the project was underway information on the progress of all activities was obtained on designed proformas and fed into computers for analysis.

The entire project is monitored under the overall control of the Project Director, Mr C. M. Dagaonkar. A project monitoring committee is constituted which contains community representatives as well as experts from many disciplines. This meets once a month to monitor progress. In addition regular visits by the funding agency, the Overseas Development Administration, and the consultant's office ensure that problems are quickly identified and remedied. Once a year a high level mission evaluates the progress and makes recommendations.

Although the programme was carried out by the Indore Development Authority the maintenance was the responsibility of the Municipal Corporation. A system of 'handing over' was established where the completed works were jointly inspected by the staff of the Development Authority, the Municipal Corporation and the members of the community before formally passing the assets to the Corporation for maintenance. Methods of funding this maintenance in the long-term are currently being identified.

The expertise of the community development team is also being retained, through the establishment of a registered NGO which can continue to provide services to the slums of Indore, as well as to other cities.

h)   Financing and costs

The Slum Networking project in Indore has been phased over a five year period. Slum Networking however is continuous, and not a one-off process. The physical works are phased over a four year period. The community development works are co-ordinated with the physical works so that the two run in tandem. A summary of the project phasing and costs are set out in Table 7 below. Subsequently, the project time frame has been extended and costs raised to Rs. 600 million to additional slum settlements, which were previously upgraded under a World Bank programme but which did not have individual services.

In Indore the main funding agency for the project has been the British government. While this was crucial for establishing and developing the project it was important that similar projects should be able to be undertaken without substantial external donor support. Alternative funding mechanisms have been developed in Baroda and Ahmedabad that do not require such support.

In addition to the ODA funding, state and local agencies have also been involved in funding the project. The Madhya Pradesh State Government is providing Rs. 20,000,000 (£351,000) for the main sewage outfalls for the city. The costs of river front improvements are being met by the private sector purchasing associated recreational and commercial facilities. The Indore Municipal Corporation is bearing the running and maintenance costs of

all the infrastructure assets created. Some of the costs of this can be recouped from the extra income received by the authority owing to the larger local tax net generated from the higher income levels of families living in the slums and from the connection charges imposed on non-slum population for their link to the mains sewerage system. The costs of running and maintaining the proposed city-level sewage treatment plant under the National River Action Plan are expected to be met from the sale of treated water and manure to local farmers. The health and education facilities created are to be maintained by their respective State Departments.

The slum-dwellers are also financial contributors to the project. All families contribute a proportion of the sewerage cost by paying for their house to be connected to the main line. The earthworks and landscaping components of the project are carried out by the community themselves through self-help and mainly at their on expense. The local community volunteers who carry out the health, educational and social components of

the programme with the slum dwellers either offer their services free of charge or receive a small honorarium from project or community funds.

Slum dwellers have access to substantial financial resources if they consider the investment worthwhile. Once their slum is improved, the stigma associated with their address is removed. A degree of permanence is given to their former precarious situation. Although the slum dwellers do not necessarily have full title to the land (30 year leasing arrangements are made with residents) they do nevertheless perceive themselves as having security. They are then prepared to invest their own resources in further improving their environment. Studies carried out have shown that such activity has already started in Indore. The average investment in their dwellings by slum families is Rs. 10,000 (£175). This is in response to an original investment of Rs. 4,200 (£74) in upgrading the physical and social environment.

3.2 Baroda - an example of increased community control

Baroda represents a critical step in the evolution of Slum Networking. Having shown at Indore that complex and large scale urban renewal programmes could be carried out, it was necessary in Baroda to move towards self sufficiency and a greater degree of community control. Hence, it was agreed that 50 per cent of the resources necessary be raised locally and that both physical and socio-economic development be undertaken by the community with the help of NGOs. As the urban infrastructure for the higher income groups is subsidised to the tune of 50 per cent from direct municipal taxes, it was felt that the same

Mr John Major, former Prime Minister of the UK, visited the Indore Habitat Project which was funded primarily by the British Government through the Overseas Development Administration. The success of the project has ensured that subsequent projects have not needed donor aid, but have attracted support from local people and industry.
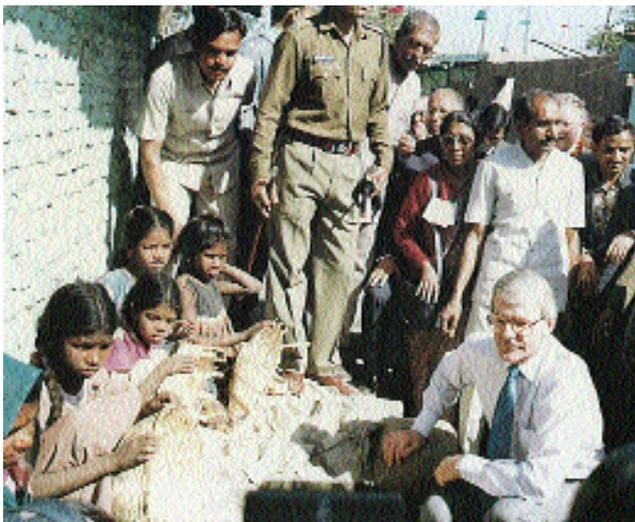
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advantage be made available to the slum dwellers. The matching contribution in slums and the cost of the works at the city level were to be borne by Baroda Municipal Corporation (BMC) from its own revenues with some bilateral grant aid.

In view of local scepticism it was decided to do a pilot project in the Ramdevnagar Slum first. It was revealing that in this pilot phase, the community committed its 50 per cent contribution within a month while the matching resources from BMC took three years to mobilise on account of legal and administrative hurdles. In the end, BMC committed 10 per cent of the costs with UNICEF providing the remaining 40 per cent. Thus, the assumed weakest link in the resource chain, namely the slum dwellers, turned out to be the strongest. It is also telling that while the pilot project, which was spearheaded by an NGO, is already nearing completion, the main city-level project handled by BMC is yet to take off the ground.

a) *Baroda City profile*

Baroda is a historic city founded around 1000 BC on the banks of River Vishwamitri. It is a major city in the state of Gujerat in India, located about 100 km from Ahmedabad and 400 km from Bombay. The city has good linkages by road, rail and air with all parts of the country.

The population of Baroda City was 10.2 million in 1991. From 1951 to 1981, the city saw a phenomenal population growth due to the establishment of major public sector industrial complexes for fertilisers, petrochemicals and oil refining. Other industries include textiles and light manufacturing units.

In the last 20 years the city population has doubled whereas the increase in the slum population has been almost four and a half times, due primarily to high levels of in-migration. 40 per cent of males and 71 per cent of females in Baroda slums are illiterate. Only a tiny proportion have any vocational training. About 25 per cent of the children aged between 5-15 do not attend schools, mainly out of the economic necessity. Poor health and education are reflected in the low monthly incomes. 58 per cent of the families earn less than the minimum wages of Rs. 1,000 (£18) per month. About 65 per cent of males and 10 per cent of women are workers out of which 35 per cent male workers and 50 per cent of women are self-employed. A total of 30 per cent of workers are underemployed. There is a clear need for intense economic development programmes which encourage cottage industries, give vocational training, generate employment opportunities and draw women in the work force. A parallel intervention of health care and education would help to break the vicious circle of illnesses, illiteracy and poverty.

The basic facilities in the slums are poor. A 1982 survey showed that 27 per cent of families did not have access to safe drinking water and 72 per cent of households did not have latrines. About 50 per cent of slum settlements do not have paved roads and most have no storm drainage. In Baroda, in Ramdevnagar, the slum was on Government land. In a memorandum of understanding with the State Government, this slum land is transferred to individual families under the provision of the Urban Land Ceiling Act.

Baroda's watercourses are highly polluted. In summer, River Vishwamitri is no more than an open sewer. In the monsoon season, the city

is frequently flooded in spite of a good drainage system because the natural water courses have been blocked in places by insensitive development. Location of slums on these drainage paths can help to address the sewerage and storm drainage problems of the city.

b) Project scope and components

The 'Baroda 2000' Project seeks to improve the entire slum matrix of Baroda in a 7 year time scale. The slums house approximately 50,000 families living in 336 slum settlements. The project contains the same elements as the Indore Habitat project and these are summarised in Table 8 below.

30 km of intercepting sewers are planned across the city between the slums along the water courses. Environmental improvement and landscaping of all the waterbodies is incorporated to create a network of freshwater lakes and green pedestrian paths. By reactivating the natural water courses, the flooding in the city will be greatly relieved. A notion of 'transition zones' has been introduced in the project. The slums do not always have clearly defined boundaries. The grey zones surrounding the slums need some input in terms of infrastructure and environmental improvements to merge the slums smoothly into the formal urban fabric.

c) Implementation framework

The project is a joint venture between the slum communities of Baroda and the BMC with NGOs playing the crucial role of facilitators and intermediaries. The main overseeing and executing body here is the Baroda Citizens' Council, an NGO which has helped the slum

dwellers set up a Community Savings and Loan Association. It had 4,000 members in October 1994 providing loans of short periods to about 1,000 households. The communities raise half the development costs for on-site development. The BMC bears the other half and also the full cost of the supporting off-site development. The BMC raises its share of the funding by combining its own resources with those available under other government schemes and bilateral grants. The NGOs help the communities to form elected neighbourhood groups, choose development options, mobilise resources, organise health, educational and economic programmes, take part in execution and assume the maintenance under a joint agreement with the Corporation. Expert services such as surveying, planning, design, supervision, project management and evaluation are provided by professionals.

As most of the slums in Baroda are situated on government owned land, the BMC will initiate procedures for the provision of security of tenure. However, this is not made a precondition for development in order to avoid long delays in execution.

d) Phasing and costs

The project was planned in two phases, a pilot project and the city wide project. Starting in 1992, the pilot study in one settlement was expected to last 18 months followed by the expansion of the programme at the city scale, which would take another 5 to 6 years. In reality, it took almost three years before the pilot project in Ramdevnagar slum could be started just to overcome the institutional intransigence to the unorthodox method adopted. However, since a firm foundation was established for the future works, the delay was not in vain.

Table 7   Summary of Indore Project phasing costs (in Rs. millions)

Component	1990/1	1991/2	1992/3	1993/4	1994/5*	Total
Physical Works in Slums	5.76	31.10	55.99	72.56	70.47	235.88
Overheads @ 8%	0.46	2.48	4.48	5.80	5.64	18.87
Sub-total	6.22	33.57	60.47	78.36	76.11	254.75
Community Halls	4.23	11.41	7.39	0.00	0.00	23.03
Dustbins	0.34	0.00	0.24	0.14	0.19	0.57
Dispensaries	0.00	0.86	0.93	1.01	0.00	2.80
Overheads @ 8%	0.00	0.98	0.69	0.09	0.02	2.12
Worksheds	0.00	2.81	3.03	0.00	0.00	5.84
Sub-total	4.57	16.06	12.28	1.24	0.21	34.36
Riverfront Development	0.00	0.00	3.77	2.05	0.00	5.82
Sewerage Scheme	0.00	13.67	15.75	17.01	0.00	46.43
Overheads @ 8%	0.00	1.09	1.26	1.36	0.00	3.71
Treatment Plant	0.00	0.00	0.00	0.00	8.00	8.00
Sub-total	0.00	14.76	20.78	20.42	8.00	63.96
CD, HQ Staff	0.45	0.49	0.52	0.57	0.61	2.64
CD, Field Staff	0.40	0.77	1.00	0.98	0.71	3.86
CD, Transport	0.06	0.03	0.02	0.00	0.00	0.11
Staff Training	0.27	0.14	0.16	0.16	0.04	0.77
Health Programmes	1.23	2.05	2.85	2.56	1.77	10.46
Economic Programmes	2.25	3.20	1.60	3.69	3.74	14.48
Social Programmes	1.47	1.09	1.74	0.66	0.44	5.40
Education Programmes	1.42	3.73	5.09	3.60	2.15	15.99
Office Costs	1.12	0.13	0.14	0.15	0.16	1.70
Mechanical Equipment	0.89	0.00	0.00	0.00	0.00	0.89
Computer	0.90	0.00	0.00	0.00	0.00	0.90
Consultants	1.32	1.45	1.39	0.68	0.29	5.13
Evaluation	0.50	0.00	0.00	0.63	0.00	1.13
Project Preparation	0.50	0.00	0.00	0.00	0.00	0.50
Sub-total	12.78	13.08	14.51	13.68	9.91	63.96
Grand Total	23.57	77.49	108.04	113.70	94.22	417.03*
Inflation Factor	1.00	1.08	1.17	1.26	1.36	

Note: Th eabove cost does not include the World Bank slums later taken up in the programme. The programme has also been extended by two more years. The final cost is now Rs.600 million.

Source: Slum Networking - A Community-based Sanitation and Environmental Improvement Programme. Experiences of Indore, Baroda and Ahmedabad. H.H. Parikh, 1995

Table 8   Key elements of Baroda 2000 project

Development component	Individual items of activity
Physical works	• roads and paving • individual water supply • house to house underground sewerage with individual toilets (in preference to public latrines) • storm drainage • street lighting • solid waste management • landscaping
Community development.	setting up neighbourhood groups, women's groups and youth activities • mobilising community savings for undertaking physical works • educational activities for pre-primary age children, school drop-outs and illiterate adults • community health education and other interventions related to mother and child care • supporting income generating activities by providing vocational training, job access to unemployed persons • developing linkages with formal sector finance to help people start small businesses and trades •
City level support	• improvement of solid waste management • strengthening of sewage network to receive slums, particularly in areas where city sewers do not exist • extension of city storm drainage to reach the slum pockets and low-lying areas • improvement of water supply pressures around slum localities • landscaping within slums and development of lakes and gardens in marginal and/or low-lying open spaces around slums • improving city roads on the peripheries of slums • environmental improvement of Sabarmati rover and the nallas of the city
Miscellaneous	• project formulation • baseline socio-economic survey • project evaluation • setting up of archives • management information system • documentation and dissemination

Source: Slum Networking - A Community-based Sanitation and Environmental Improvement
          Programme. Experiences of Indore, Baroda and Ahmedabad. H.H. Parikh, 1995

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Table 9 Baroda 2000 - cost estimates

Components	Unit cost	Nos.	Total cost (Rs. Million)
Engineering			
Physical improvement in slums	5650.00	50,000	282.5
Physical improvement in transition zone	1000.00	50,000	50.0
Physical survey	1.5%	332.5	1.7
Design & consultancy	2% x 6650	50,000	6.7
Establishment	8%	332.5	26.5
Subtotal A			367.3
Environmental			
Improvement of ponds and river	1800.00	20 km	36.0
Intercepting sewers	1200.00	30 km	36.0
Physical survey	1.5%	72.0	0.4
Design & consultancy	2%	72.0	1.4
Establishment	8%	72.0	5.8
Subtotal B			79.6
Community & health			
Community halls	300,000	120	36.0
Design & consultancy	2%	36.0	0.7
Establishment	8%	36.0	2.9
Community development	1100.00	50,000	55.0
Community corpus	100.00	50,000	5.0
Subtotal C			99.6
Miscellaneous			
Project formulation and report	L.s		1.1
Baseline socio-economic survey	L.s		0.9
Project evaluation	L.s		1.4
Archives and establishment	L.s		4.5
MIS and establishment	L.s		2.5
Documentation	L.s		0.5
Subtotal D			10.9
Grand Total			557.4

Source: Slum Networking - A Community-based Sanitation and Environmental
Improvement Programme. Experiences of Indore, Baroda and Ahmedabad.
H.H. Parikh, 1995

As seen in Table 9 , the total project cost in 1992 prices is estimated at Rs. 557.4 million (£9,787,533). When this project was conceived, it was anticipated that it would take some years to fully gear up. The prices therefore allow for 3 - 4 years of inflation and hold good even today. This cost does not take into account the building premises and the other administrative staff which will be provided by the BMC at its own expense. The cost of any land acquisition for rehabilitation is also not included in the project proposals. The average cost per family for the physical works in the slums is Rs. 5,650 (£99) and that for community development is Rs. 1,100 (£19).

No financial provision has been made for future increase in the slum population beyond the project date since mechanisms are already incorporated to recycle the resources mobilised by the communities into a fund for dealing with subsequent growth.

e)   Ramdevnagar pilot project

● Background

The pilot project at Ramdevnagar Slum explodes the myth that the slum dwellers are not willing or able to contribute towards their own development. It further demonstrates that the community in partnership with NGOs can initiate and control development. The outcome is very significant because it sets a precedent for action in the rest of the slums in Baroda.

The project attempts to mobilise the communities, determine their needs and then bring together all available resources to meet these needs. This requires the co-operation of all those involved - the community, NGOs, professionals and the government and a combining of resources from all quarters, the government, the private sector, other support agencies and the slum dwellers themselves.

Many technical innovations have been introduced in the project to cut costs and at the same time provide solutions which are more appropriate to the needs of the community. Individual sanitation is proposed at costs lower than community latrines. This eliminates the usual problems of maintenance and provides greater privacy and dignity.

● Project profile

The slum of Ramdevnagar comprises about 820 households and is situated on Gotri Lake in the western part of Baroda City. It is devoid of any urban infrastructure other than some public water taps and street lighting, which are both inadequate. Situated on the bank of a lake, parts of the slum get flooded during monsoons.

The most pressing need expressed consistently by the slum dwellers, particularly women, is for adequate water supply and good sanitation facilities. The environmental improvement proposed includes provision of roads, stormwater drains, water supply, house to house underground sewerage, filling of low lying areas and landscaping. Baroda Citizens Council (BCC), a highly reputable NGO, with an active presence in Ramdevnagar has taken up the execution through community participation and under expert supervision. The existing solid waste collection programme organised by BCC in the other parts of the city is also extended into Ramdevnagar.

BCC has initiated the process of community awareness at Ramdevnagar with an organised

effort to mobilise resources and capacities within the community to meet their needs. Using past experience BCC has initiated a number of activities to help meet these needs in the fields of health, education, economic improvement recreation and local leadership skills.

● **Implementation structure**

Baroda Citizens Council (BCC) is the central agency responsible for undertaking the physical as well as community development works in Ramdevnagar. It is a non-governmental organisation set up in 1966 by the Gujarat Federation of Mills and Industries, Baroda Municipal Corporation and MS University. It is already working in 30 slums of Baroda covering 12,000 families. Its main objective is to improve the quality of life of the urban poor by community development comprising education, health, vocational training, sanitation and shelter improvement programmes. Over the years, Baroda Citizens Council has developed rapport with other NGOs and their support too will be sought in the venture.

The conventional delivery mechanisms used to date have not been successful in providing an improved and affordable water supply and sanitation service. Inadequate access to finance is a major problem for poor households in the slums and BCC has established a Community Savings and Loan Association (CSLA) to provide finance to the slum dwellers. It has at present 4000 members and has provided small loans short-term to about 1,000 households. These loans are used for house repairs, toilet construction, pregnancy, hospitalisation and self employment. In Ramdevnagar the CSLA has been strengthened to meet the increasing demand of loans from the savers for the slum development. The

neighbourhood committee plays an active role in determining the nature of development. Women have a majority representation in the committee and have played a leading role in articulating their demands, activating the community and mobilising the resources.

A contractor with a good track record of working in slums has been selected and appointed by the community with the assistance from Engineering Sewa Trust, an NGO providing technical services for socially oriented projects. The project management services and quality control checks on behalf of the community are also provided by the same NGO. Masons and plumbers have been identified within the community whose services can be utilised by the main contractor. Top quality professional services have been used for physical surveys, engineering design and planning services.

Baroda Municipal Corporation has provided the off site infrastructure support such as the water supply and sewerage connections. As the slum is on government land the Baroda Collector has agreed to start the process of transferring the ownership of the land to the slum dwellers. Local industry has accepted the responsibility of environmental improvement of the lake around which Ramdevnagar is situated and converting the banks into recreational green spaces for the citizens of Baroda.

The project is monitored by a steering committee comprising the elected leaders of the community, the director of Baroda Citizens Council, the Municipal Commissioner and the project consultant. All decisions and approvals related to the project are made by this committee. Over half the community representatives are women.

● Cost and contributions

As seen in the table below, the cost of physical works in the Ramdevnagar Slum is estimated at Rs. 4,466,000 (£78,351), which includes the cost of providing 8 collection trolleys for solid waste management (£888). The monthly charges for collection and disposal will be paid directly by the community. The slum dwellers contribute 50 per cent of the development cost. The remaining Rs. 2,233,000 (£39,175) is raised from other sources (UNICEF, BMC and local industry). The construction cost of individual toilets is borne by the slum dwellers themselves from their own resources. Since urban infrastructure services for upper income groups are at present highly subsidised it would be unfair not to extend a similar subsidy level to the slum dwellers.

The health, education, economic development, leadership development and convergence components are estimated at about 10 per cent of the project cost, i.e. Rs. 446,000 (£7,825). The cost covers community development and also the strengthening of the institutional structure of BCC so that it can develop capability to manage this project as well as

similar works in the future. Half of this sum is met from BCC's own resources and the rest from UNICEF.

Although the families are willing to pay their 50 per cent contribution, they need some short term credit facilities to be able to do so. The CSLA is used to provide this facility. Members have enrolled into CSLA with an initial deposit of Rs. 500 per family against which a one year loan is provided to cover their contribution. The revolving fund of the CSLA has been strengthened to meet this sudden surge in demand. A grant of Rs. 1,000,000 (£17,544) is provided by UNICEF to meet this need. Once the loans have been recovered from the slum dwellers of Ramdevnagar, this revolving fund will be used to start similar programmes in other slums of Baroda.

The work at Ramdevnagar is shortly coming to an end. The underground services and house-to-house connections for water supply, sewerage and storm drainage have been implemented. Earthworks are complete and road construction is about to be started.

Table 10   Costs and contributions for the Ramdevnagar pilot project

Component	Cost (Rs. Million)	Source				
		Community	UNICEF	BCC	BMC	Others
Physical works & solid waste	4.466	2.233	1.117		0.500	0.616
Community development	0.446		0.223	0.223		
CSLA revolving fund	1.000		1.000			
Total	5.912	2.233	2.340	0.223	0.500	0.616

Note: In addition to the contribution shown above, the community will also bear the cost of building their own toilets.

Source: Slum Networking - A Community-based Sanitation and Environmental Improvement Programme. Experiences of Indore, Baroda and Ahmedabad. H.H. Parikh, 1995

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3.3 Ahmedabad - an example of financial self-sufficiency

Experience gained in Indore and Baroda has been used to develop the Slum Networking approach in Ahmedabad. Although Ahmedabad is a much larger city the process of organising the work has taken a much shorter time and in addition complete self-sufficiency of funding has been achieved, thus illustrating the replicability of the Slum Networking concept.

Having demonstrated that city wide urban renewal can be undertaken using slums as opportunities (Indore) and that communities can mobilise resources and control the development process with the help of NGOs (Baroda), the prime objectives for Ahmedabad are redefined to take into account the contribution of the private sector as follows:

- improve the overall quality of life of the urban poor in terms of health, education, skill upgrading and access to finance for shelter improvement and income generation.

- transform the sanitation and environment entire slum matrix of Ahmedabad within a set time scale.

- revitalise the service infrastructure and environment of the city as a whole as a consequence of slum intervention.

- converge the strengths of the communities, economic forces of the city and the government for the planning and implementation of the programme.

a)   Ahmedabad city profile

Ahmedabad is the seventh largest city in India with a population of 3.3 million spread over an area of more than 200 sq. km. It is a major centre for trade, commerce and industry in India and the city is well connected by air, rail and roads to the other parts of the country.

The slums in and around the city are growing at a rapid rate. Currently about 40 per cent of the city's population lives in slums. In 1986, the city boundaries were extended to absorb the peripheral industrial areas which had very poor levels of urban infrastructure and this exacerbated the slum problem of the city. In Ahmedabad slums are located on Municipal lands, Government lands and on private lands. For the Municipal lands, the Municipal Corporation has given 10 years written security of tenure with the view that this is as good as permanent ownership one can get without the gigantic task of changing national laws with respect to land ownership in slums. The Municipal Corporation in Ahmedabad has also formally moved the State Government to take similar action for all the slums on Government land. For the private lands, the Ahmedabad Municipal Corporation uses its statutory powers to provide health and sanitation facilities to execute the works. At the same time it has assured the slum dwellers on the private lands that the Municipal Corporation will not support any eviction moves by private owners. Most private lands with slums have long arrears of Municipal taxes. Ahmedabad Municipal Corporation is using this a s a leverage to persuade the private owners to sell the land at below the market prices to the individual families.

In spite of its problems Ahmedabad is in a

good position to meet these challenges. It has a tradition of good civic management and a history of close co-operation between the Municipal Corporation and industry. Together with the vibrant economy of the city, this offers an opportunity to mobilise and harness the resources for comprehensive revitalisation of the city. In addition, the city has a university, many leading institutions of national repute and a pool of motivated NGOs and individuals. Many pioneering movements from the independence struggle to women's banking have originated from Ahmedabad.

In 1991 1,170,000 persons lived in 2,412 slums and chawls (tenement shanties) within the city limits. The chawls were built primarily to house the industrial workers and had only the most minimal facilities. The housing stock and the services have subsequently deteriorated to very poor conditions. Allowing for growth after 1991, a target of 300,000 families, i.e. 1.5 million persons, is assumed for the city's slum improvement programme.

The environment and sanitation conditions in slums and chawls are of serious concern. It is estimated that about 500,000 slum dwellers in Ahmedabad have no toilet facilities and they defecate in the open. Most of the rest use community latrines. Only a very few families own individual toilets. 70 per cent of community latrines are non-functional at any given time. The slums in existence prior to 1976 have water supply from public standposts or individual connections, though the pressures are generally poor. The later slums get water from shallow hand pumps or fetch it from long distances. The water often gets contaminated by contact with surface water and open drains. Many slums in the city are not connected by sewers to the city system and in the peripheral

areas where the city drains are not yet laid, the conditions are even worse. Many of the internal areas of the slums are unpaved and also without storm drainage. During the monsoons these slums become quite treacherous. Since many of the slums are on private land, the Corporation is not legally responsible for street sweeping and solid waste collection.

The poor environmental and sanitation conditions in slums result in frequent outbreaks of epidemics. Poverty, bad work environment and lack of education compound the health problems in slums. As a result, many slum dwellers suffer from water borne diseases, malnourishment, respiratory infections, tuberculosis, skin diseases, anaemia etc. The lower levels of literacy in slums affect both the health and family planning awareness and at the same time limit the opportunities for better employment and incomes.

b) Project scope and components

The project is designed to improve the living conditions of the entire slum population of Ahmedabad City, over a period of about seven years. The associated strengthening of urban infrastructure networks and environmental improvements at the city level is also undertaken in parallel by networking the slums. The main components of development are as for Baroda (see Table 8 above).

Many of the project components above are common to those detailed earlier for Indore and Baroda. The implementation structure has been refined, however, to adjust to the new financing mechanisms developed.

c) Project implementation

The Ahmedabad Slum Networking project is a joint effort between the communities living in the slums, Ahmedabad Municipal Corporation and local industry. They jointly determine the development and also share the costs. NGOs and professionals are involved as intermediaries and their individual roles are set out in detail below. Table 11 below shows the financial contributions of the different groups involved.

Traditionally slum improvement projects are fully planned and carried out by the local authorities. This has certain disadvantages. The communities become recipients instead of the instigators of the project and expect all facilities to be provided free of cost. Implementation by the local authority often leads to poor results because of insufficient attention to detail and also precludes potentially gainful inputs from other sources such as the private sector and industry which too have

expertise in the planning, execution and management of projects of scale. At the same time local authorities do have certain advantages in terms of democratic accountability, legislative authority, civic management and a vast technical pool.

The implementation process used in Ahmedabad combines the strengths of all the participating parties, with the community playing a pivotal role. Roles vary according to the scale and nature of the task. For the execution of the works, the slums are grouped in convenient packages. Consortia of reputable industries and NGOs bid for the work on behalf of the communities within the design framework established by the Corporation. In a country where city development falls strictly within the purview of the state and local governments, this is a very bold transition which will have far reaching consequences. The Corporation too has set up a parallel works department to bid for the work. This competition will improve the overall quality of

Table 11   Ahmedabad project costs and contributions (1996 costs)

Components	Total cost (Rs. Million)	AMC/Govt %	Community %	Industry/NGO %
Engineering Physical improvement in slums	1800.0	33	33	33
City level infrastructure & environmental improvement	900.0	70		30
Physical survey	13.5	100		
Design & consultancy	54.0	100		
Establishment	148.5	70		30
Community & health	300.0	70		30
Community corpus	30.0		100	
Miscellaneous	10.9	100		
Grand total	3256.9	49	19	31

Source: Slum Networking - A Community-based Sanitation and Environmental Improvement Programme. Experiences of Indore, Baroda and Ahmedabad. H.H. Parikh, 1995

Note: Above costs do not include shelter upgrading and individual toilet constructions which will be borne by the community from its own resources or with the help of the 20:80 LCS scheme.

work carried out and also enable the Corporation to build up a long term implementation structure which is both efficient and sensitive. For the wider city level works the Corporation is the principal agency for both planning and execution, though some inputs from the private sector are again anticipated. The programme is dovetailed into other current national urban improvement and health/education schemes and funding arrangements.

A similar approach is also planned for resource mobilisation. With the help of NGOs, the community thrift groups are being organised into savings and loan societies. Support is given to both the individual families and the societies in turn to be supported by dedicated financial institutions such as Self-Employed Women's Association (SEWA), Friends of Women's World Banking (FWWB) and Housing and Urban Development Corporation (HUDCO). At the city scale HUDCO is prepared to finance all the parties, namely, the industrial firms, the Municipal Corporation and the communities to meet their respective shares of the costs. HUDCO normally provides bridging finance to government bodies. In Ahmedabad they have agreed to extend the bridging finance to industries and communities (through NGOs) should they also require this facility to meet their share of the expenses. HUDCO finance comes in the form of medium and long term loans.

Over 70 per cent of Ahmedabad slums are located on private land, the rest being on municipal and government lands. Ownership of land is not made a pre-condition of the project as it can result in long legal and administrative delays. However, Ahmedabad Municipal Corporation has the statutory right to install

essential services on private land and has also passed a resolution not to evict the participating slum dwellers for 10 years and to register them formally as ratepayers. These two measures provide sufficient perceived security of tenure for the slum dwellers to invest heavily in their shelter from their own resources. At a suitable point of time in the future, the corporation will also consider bringing the private land owners and the slum dwellers around the same table to discuss land transfer on mutually agreeable terms.

The approach adopted in Ahmedabad favours upgrading in preference to demolition and reconstruction, although alternative strategies which require redevelopment are not excluded when they have greater advantages. For example, where the high land values can be used as a potential resource to finance house construction for the urban poor through densification.

The project is monitored by a steering group which has members from the community, industry and the Corporation.

- **The role of the slum communities**

One third of the development cost within slums is borne by the community with matching inputs of one third each by the Corporation and industry. The slum dwellers thus have a controlling role in their development and play an active part in the slum level planning, execution and subsequent maintenance. Although the project envisages individual latrines, the responsibility of toilet construction belongs to the householders. The present 20:80 Low Cost Sanitation scheme (LCS) of the Corporation is converged with the programme so that the families can build their own toilets with an 80 per cent corporation subsidy. The

cost of upgrading individual dwellings is borne by the families themselves and low-cost financing mechanisms have been developed to assist them in this process.

Democratically elected Neighbourhood Associations, formed through democratic processes, are responsible for mobilising the community's share of costs for the physical works. They also run the socio-economic programmes developed under the project. Each family has to initially contribute Rs. 100 to finance these activities and manage the community assets. The fund is regularly replenished as and when needed. The Neighbourhood Associations will be encouraged to collect the rates on behalf of the Corporation and, as an inducement, permitted to retain a proportion for minor repairs and maintenance of the municipal services at the neighbourhood level. Each association enters into an agreement with the Corporation to define their respective responsibilities.

Both in terms of numbers and the key positions, majority representation of women is stipulated in the Neighbourhood Associations.

- **The role of Ahmedabad Municipal Corporation**

The Corporation is a joint financier of the project, contributing one third of the physical development cost in the slums, 70 per cent of the costs of city level programmes. It bears fully the costs of project preparation, surveys, consulting charges, evaluations, documentation and dissemination. It has also incorporated its existing 20:80 Individual Toilet scheme into the project. The Corporation draws on national schemes for financial support where available.

At the city level, the Corporation will develop a

framework in which the slum matrix of the city and the associated city level infrastructure needs are integrated. It will also determine the policies with regards to tenure, rates, sale of land, restructuring of slums, rehabilitation, supporting 'site and service' projects, implementation of 74th amendment and maintenance. The planning and execution of the city level infrastructure and environmental improvement programmes outside the slum boundaries are the responsibilities of the Corporation, though private sector contribution to cost and execution is encouraged where appropriate. The city level service infrastructure will be maintained by the Corporation from its rates and taxes and slum dwellers will be encouraged to register as rate payers so as to increase the tax base. Registering as ratepayers increases the sense of security for slum dwellers.

In view of the importance of the programme, a dedicated cell has been set up within the Corporation, headed by a senior Deputy Commissioner and drawing upon a large resource pool of technical and community development persons at his disposal.

- **The role of industry and private sector**

Local industry represents a significant resource base. It also has the entrepreneurial, management and technical skills which can be utilised for the project. Many aspects of the project such as physical and community development within slums, solid waste management and environmental improvements are spearheaded by the private sector.

Industry has a clear interest in the development of the city. Its growth is dependent on the infrastructure which the city

provides. The image of an industry is closely interlinked with that of its host city, and can play its part in attracting the investment and professionals needed for success. The connection between industrial prosperity and the living conditions and skill levels of its workforce is now well understood. Much of the unskilled industrial workforce in Ahmedabad lives in slums. Therefore, investment in the environmental improvements and skill upgrading in slums makes sense to industry and also benefits its workers in terms of income levels and quality of life. It is for this reason that industrial firms of Ahmedabad are prepared to provide one third of the physical upgrading cost within slums and 30 per cent of costs for community development and the city level infrastructure development. Industries responsible for the pollution of the city's water courses are expected to pay for the required anti-pollution measures, such as drainage and treatment.

Where possible, BOT (Build, Operate and Transfer) mechanism for raising the resources from the private sector and implementing components of the project will be considered. There are now institutions such as ILFS (Infrastructure Leasing and Financing Services) in India which undertake such assignments.

- **The role of professionals**

To ensure excellence in planning, design and execution of the works, the best professionals are employed for the project. They are responsible for surveys, planning, detailed designs, quality control, project management and evaluations. Experts are also employed to design and monitor the health, education and community training programmes.

- **The role of the NGOs**

The NGOs play an important role of facilitators, acting as intermediaries between the government and the communities. Their main tasks are to organise the communities, assist with resource mobilisation and initiate the health, educational and income generation programmes. They work with the existing community based organisations (CBOs) in the settlements and strengthen them so that eventually the CBOs take over fully all the community related activities in the area. Ahmedabad Municipal Corporation funds only 70 per cent of the community development cost, the remaining 30 per cent has to be contributed by the NGOs from their own sources. This is to ensure that only the committed organisations are involved with the programme.

d) Phasing and costs

The project is planned in two phases. The first phase includes preparatory surveys and engineering designs within slums for 25,000 families and implementation of the pilot project covering 5,000 families. This phase is expected to last 18-24 months. Phase II will cover the rest and is expected to take another 5 years. The phasing will be kept flexible in response to the experiences gained from the pilot in Phase 1. So far, out of 5,000 families planned for the pilot project, only 3,300 families have actively been pursued.

The pilot project tests the basic tenets of Slum Networking in the context of Ahmedabad. Within the overall parameter established by Ahmedabad Municipal Corporation, this initiative has been taken up by a consortium of Arvind Mills Limited, an industrial house of national repute and "SAATH", a city-based NGO which has been actively involved in grassroots

development of slums since 1989. "SAATH's"
major areas of intervention have been in the
fields of community development, health, non-
formal education, skill imparting and income
generation. Services of Engineering Sewa
Trust, an NGO offering technical support to
socially relevant projects, are being utilised for
project management and quality control during
execution. The project covers approximately
3,300 households living in slums and chawls in
four pockets located in different zones of
Ahmedabad City. Spatially, each pocket is
taken up fully between the main roads,
irrespective of ownership and tenure.

The project cost for the two phases is Rs.
3,256,900,000 (£72,000,000), distributed
between the three partners, namely, the
community, industry consortium and the
Corporation as shown in Table 11 on page 54.

The work in the first slum of the pilot project
called Sanjaynagar has now been completed
and the resource mobilisation in the other
slums of the pilot project is at an advanced
stage. The physical works in the remaining
slums of the pilot project are shortly to start.
In the wake of successful implementation of
just one of the pilot slums, demand is now
coming from many slums across the city, to be
taken up under the project.

It is also interesting that during the
implementation of Sanjaynagar most families
have now built permanent houses at their own
expense, ranging from Rs. 10,000 (£175) to
Rs.20,000 (£350). An old dilapidated
community toilet at Sanjaynagar was
demolished at the request of the community
and has been replaced by house to house
sewerage.

4 Replication of the Slum Networking Approach

If the success of a project relies simply on the enthusiasm and energy of one person, or relies on a one-off source of funding or type of organisation, then it cannot be easily replicated. Although such one-off projects are undeniably important for those that benefit directly from them, those projects that do have a clearly identifiable and replicable process have a much wider impact and bring greater value to the world. A clearly identifiable process facilitates easier adaptation and replication of the project elsewhere.

- the process involved in Slum Networking is soundly based and clear;
- the approach is flexible and can be adapted to meet differing needs;
- it works within the framework of existing institutions and traditions;
- it does not rely on aid funding;
- it uses limited resources which are readily available;
- it introduces solutions which are more effective as well as being cheaper than previous ones.

4.1 Project or process?

When work first started in Indore it was seen more as a project rather than a process. It was only during the actual implementation that the importance of sustaining the assets and activities was fully realised. Thought then had to be given on how best to achieve longer-term sustainability within the project. Having done this, the project was then recognised as being widely capable of adaptation and replication to meet similar needs in other Indian cities.

The Slum Networking approach can be easily adapted elsewhere because

The main weakness of the Indore Habitat Project where Slum Networking was first developed was that it was primarily financed by grant aid from the British government. It was therefore open to question whether or not the successful work carried out there could be replicated elsewhere when there were no large sums of donor aid to support the work.

Grant-aided work should not be dismissed out of hand. It does serve the purpose of supporting innovative and experimental programmes which would not otherwise attract finance from conventional sources. There are drawbacks however in the use of grants in that

they encourage an attitude of dependency in the recipient countries. They also tend to be channelled through government structures, which means that development is dominated by public agencies, who are not usually renowned for their enlightenment or efficiency.

In spite of the deficiencies mentioned above the Indore Habitat Project has been an inspiration to other cities in India. It has provided a valuable learning process for all persons involved and been successively adapted, first in Baroda and then in Ahmedabad. Each time the successful elements have been adopted and replicated and the deficiencies have been made good as the levels of financial viability and community control have increased. Over a period of eight years Slum Networking has matured into a holistic and lasting strategy which can be replicated on a mass scale.

4.2 Opportunities for further expansion

Huge resources are spent every year by the Indian government on poverty alleviation under a variety of national programmes. Yet there is very little sustained improvement to show for it. Enormous sums are dissipated for lack of focus and the end result is nothing more than sporadic amelioration.

It is normally assumed that slum dwellers do not have the capacity to finance their own upgrading. Detailed studies have been carried out which show clearly that the propensity to invest is primarily triggered not by legal tenure of the land but rather by 'perceived security' and faith that the locality will improve with time. Slum upgrading achieves this. Studies

carried out show that slum dwellers are willing to invest for water and sanitation. On average this sum varies between Rs. 1,500 and Rs. 5,000 (£26 - £88) per family depending on the city. In Baroda slum dwellers have readily committed Rs. 2,600 (£46) per family for environmental improvements. In Ahmedabad families in the pilot slums are prepared to invest Rs. 2,000 (£35) per family and the local industries are matching this contribution. In addition, in all cases, the cost of home improvement is met by the families themselves.

If the available government funds could be converged with the resources of the slum dwellers themselves, a very substantial impact could be achieved. For example, under the government's Environmental Improvement of Urban Slums scheme Rs. 2,500 per family is made available. Other physical improvement programmes which could be dovetailed into the Slum Networking programme include the Urban Community Development Programmes, Urban Basic Services for the Poor Programmes, Environmental Improvement Schemes, Town Planning Schemes, Land Ceiling Act, Nehru Rojgar Yojana, Health and Education Schemes undertaken by state departments, Integrated Child Development Scheme and the National River Action Plan.

If the resources of the government and slum dwellers are combined there is no need to contemplate beggarly solutions such as public latrines, common hand pumps, partial brick paving of poor quality and open gutters. These measures are cosmetic and not durable. Instead a high quality infrastructure can be provided with concrete roads, individual water supply and toilet connections, underground sewerage, storm drainage, landscaping,

streetlighting and solid waste management.

How then can the resources of the slum dwellers be released? What measures encourage the co-operation of the slum dwellers? The slum dwellers are astute and unlikely to pay for something they don't really need or can get for nothing from someone else. The following guidelines identify the key factors to ensure success of the approach.

- The proposed physical improvements have to be affordable and meet community needs.

- The completed improvements need to live up to the community's expectation and should be capable of transferring from the micro to the macro scale.

- Mechanisms need to be in place to enable resources of the slum dwellers to be mobilised.

- The community has to have control over the development and be consulted from the outset of the project.

- The programme must not be projected as a 'government scheme' but instead as a community initiative in which the government and private sector are the partners. The slum dwellers are clear that they will not be receiving anything for free.

4.3 Role of government in encouraging replication

There is much that the government can do to enable and facilitate the Slum Networking

programme through easing of financial and legal mechanisms. These include

- Helping formalise community thrift societies and savings and loan societies and link them into external finance to strengthen their capacity for resource mobilisation in the community.

- Helping establish apex financial institutions to provide working capital to the Savings and Loan Societies and to lend money to the intermediate private sector organisation such as SEWA bank and the Housing Development Finance Corporation (HDFC) for the same purpose. The Grameen Bank in Bangladesh is another example of a good role model.

- Encouraging NGOs to become the links between the formal finance and the community societies.

- Amending existing legislation. For example, the Rent Control Act (designed to offer security of tenure) and the Land Ceiling Act (designed to provide affordable land for the poor) have both served rather to starve the cities of shelter and land and into the bargain have encouraged widespread malpractices and corruption. The legislation is retained for political expediency. In a similar fashion, the 74th Amendment to the Constitution to empower the people does not have commensurate legal teeth to mobilise and control resources at the local level.

- Encouraging the replication of the better state legislative frameworks regarding land tenure. In Madhya Pradesh and Andhra Pradesh, for example, where a progressive framework exists, the improvement has been very noticeable. In many other states the

notification procedures for intervention in slums is limited in scope.

● Giving serious thought to the role and function of Slum Clearance Boards, Housing Boards, Water Supply and Sanitation Boards and Public Works Departments, as well as that of the municipal authorities and development authorities at the city level. State and city agencies have not always proved to be the most efficient or competent of agencies for implementation and there may well be an increasing role for the private sector.

4.4   An external perspective

The Indore Habitat Project was visited and critically assessed by the international study group. This group included planners, architects, financial and legal experts as well as development workers from many countries around the world. Each brought their own perspective to the project and provided a critical assessment as a result of visiting the project. Most of the study visit time was spent in the slum communities, visiting the various aspects of the project. The key points made by the group are set out below.

● Physical improvements

There was much surprise and admiration by the group that such a large scale urban improvement project, which involves an entire city, was capable of being implemented and of showing positive results in such a short time span. It was also felt that the changes would be a permanent rather than just a fleeting improvement. This was felt to be particularly

impressive in view of the fact that the beneficiaries were in the very lowest of income groups. Co-ordination of activity and careful planning and monitoring of activity were felt to be the key factors in achieving this success and the Indore Development Authority and Mr Parikh were much congratulated on its success in improving the infrastructure of the entire city, as well as bringing about much improved living conditions for the slum dwellers.

The process of Slum Networking had managed to give shape to the shapeless through its process of linking all the slum communities along the river courses. It was felt that the city as a whole was made more attractive because of the work carried out in the slums and that this would have many benefits for all the city's population and not only the slum dwellers. It was very evident that the initial improvements to the infrastructure had led to the slum dwellers investing their own resources in improving their dwellings. Many of these dwellings were most impressive. They exceeded simple shelter needs both in terms of their size and architectural design and were a good indicator of the success of the project. The fact that the women of the communities had been primarily responsible for much of the good work carried out was also felt to be very positive.

● Community involvement

The people living in the slums appeared to be happy. They lived with dignity in a cleaner, more attractive and decent city. Emphasis upon the importance of the women as a catalyst for change in the slums was felt to be particularly worthwhile. The community development programmes of health, education, employment and women's rights were well co-ordinated, both with each other and with the

programme of physical improvements. An indicator of the quality of the community development carried out was the way that religious integration of the various communities had been handled. Empowerment of local community-based groups had obviously taken place and it was felt that this would go a long way in ensuring sustainability of the project

● Integration

The project was considered to be a good needs-led project in an urban setting that has adopted the integrated approach to tackling urban poverty with success. The integration of the various aspects of the project was felt to be an extremely important factor in the obvious success that the project has achieved.

● Concerns relating to the project

One of the major concerns of the group was not a criticism of the Indore Habitat Project itself, but rather it related to the future of Indian cities and whether programmes such as the Indore Habitat Project were the best way of dealing with future urbanisation pressures. Although there was no doubt as to the effectiveness of the Slum Networking approach in dealing with the problems of existing slums it was felt that it did not actually do anything

to stop the slums forming in the first place.

It was felt that forward planning of urban settlements deserves far greater attention than it is receiving at present and that this would be a much more efficient and cost-effective way to anticipate population growth in urban areas and plan the necessary infrastructure to cope with it than to deal with the slums when they are already a reality. It was also felt that more work was needed in the rural areas from where the population comes, with the object of decreasing the flow of people to the city.

Concern was also expressed as to what would happen in ten or fifteen years time when inevitably there would be more people living in the slum than there are currently. The present low-density of the slums would obviously allow for a certain degree of densification, but the capacity of the infrastructure to cope with a substantially increased population was questioned.

Solid waste management was obviously a problem in some of the slums where the systems designed to deal with it were clearly not working. This problem was acknowledged by the Development Authority who were taking steps to deal with it.

5 Reference and Further Information

In November 1995 a study visit was organised by the Building and Social Housing Foundation to the World Habitat Award winning Indore Habitat Project in Indore, India. Bursary funding was made available to help meet the costs of participants from developing countries to attend. Regretfully, many others had to be refused. This section is designed to provide sources of further reference for those who wish to find out more about the project.

Details are provided of the individuals and organisations connected to the Indore Habitat Project in India. Full information on addresses, telephone and fax numbers is provided in order that further information can easily be acquired. Secondly, information is provided on the Building and Social Housing Foundation and its activities including full details of the World Habitat Awards. Thirdly, there is a list of all those who attended the study visit with addresses and telephone/fax numbers. These persons come from a wide range of countries and are able to give details of their own first hand experience of the project.

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5.2 The Building and Social Housing Foundation

The Building and Social Housing Foundation (BSHF) is a research institute based in Coalville, Leicestershire in the United Kingdom. It is an independent research body which received its financial endowment from a building organisation formed by a group of homeless and penniless ex-servicemen just after World War Two. The Foundation carries out research into all aspects of housing, concerning itself with the immediate and practical problems of housing today as well as attempting to look to the future in a progressive and imaginative way. Of particular interest is the need to identify a sustainable and viable way of life for the future in both the developed and developing world and the reallocation of resources away from wasteful expenditure on armaments to meeting the shelter needs of the millions of homeless around the world.

BSHF is not concerned with identifying problems, but rather with focusing attention on solutions and bringing about improvements in housing conditions throughout the world. This it does through a variety of activities which are detailed below. In all its work it aims to avoid bureaucracy, eliminate the waste of resources and encourage self-help and self-reliance.

● The World Habitat Awards

A major area of BSHF activity is the annual World Habitat Award competition which it organises and sponsors. The World Habitat Awards were initiated in 1985 as part of the Building and Social Housing Foundation's contribution to the United Nations International Year of Shelter for the Homeless in 1987. The principle objective of the international year was for every nation to draw up strategies, policies and programmes that would enable practical and attainable improvements to be made in the shelter and neighbourhoods of all poor and disadvantaged people by the year 2000. The World Habitat Awards were initiated in order to identify innovative and successful human settlement projects throughout the world which could be replicated elsewhere. Every year the competition has attracted quality, innovative projects, capable of replication in either the developed or developing world. To date winning projects have been identified in Turkey, India, Malawi, United Kingdom, Sri Lanka, United States of America, Poland, Egypt, Switzerland, Cyprus, Costa Rica, Japan, Venezuela, Czecholslovakia, Philippines, Singapore, Indonesia, Germany, China, Denmark, Namibia, Canada and Ecuador.

Each year two cash awards of £10,000 and individually designed and crafted silver trophies are presented to the winners of the competition on World Habitat Day.

● International study visits

An international study visit is also organised each year in collaboration with the United Nations and national governments in order that the winning World Habitat Award housing solutions can be made better known and their replication encouraged throughout the world. Highly successful study visits have been held to date in Malawi, Sri Lanka, Costa Rica, Philippines, Singapore, Indonesia, Beijing and India and as a result the programmes studied in these countries are now being replicated throughout the world. Bursaries are made available enabling participants from a range of

developing countries to attend.

● Misallocation of resources

This is a continuing underlying theme of the Foundation's activities. As part of its contribution to the 1987 International Year of Shelter for the Homeless, the Foundation published a Handbook of Readings on the overall theme of homelessness and the misallocation of global resources. World leaders and others renowned for their expertise and independent thought contributed to the Handbook, including Dr Willy Brandt, Brigadier M N Harbottle, Rt. Hon. Enoch Powell, Hon. R Premadasa the President of Sri Lanka and Ms Diana Schumacher. All proceeds from the sale of the handbook have been sent to SPARC, an organisation helping the pavement dwellers of Bombay help themselves.

● Sustainable futures

The Foundation maintains an active commitment to researching the possibilities for sustainable housing and is currently carrying out research in collaboration with the Tsinghua University of Beijing into sustainable village development in southern China and has held a Consultation at St. George's House, Windsor Castle on Human Settlements as part of a Sustainable Future.

● United Kingdom based housing research

In addition to its work internationally, the Building and Social Housing Foundation has carried out research into national housing issues, including the protection afforded by residential housing in the event of nuclear attack and the deterioration of the public housing stock in the UK. Further research work has also been carried out on local housing issues, including an Inquiry into Leicestershire Housing and a study of the regeneration of a mining town, which investigated the future provision of housing and employment in Coalville in the 1990's.

A list of Building and Social Housing Foundation publications are set out below and can be obtained from the Building and Social Housing Foundation on request.

Publications

World Habitat Day 1996: Presentation of the World Habitat Awards in Budapest, Hungary (1996)   (free)

Human Settlements as part of a Sustainable Future   (1996)   £5.00

The World Habitat Awards 1990 - 1994 (1996)   £15.00

How to Abolish War. Editor - B W Walker (1995)   £7.00

World Habitat Day 1995: Presentation of the World Habitat Awards in Curitiba, Brazil (1995)   (free)

Alternative Futures - the Reallocation of Power and Responsibility   (1995)   £5.00

World Habitat Day 1994: Presentation of the World Habitat Awards in Dakar, Senegal (1994)   (free)

Innovative Housing Solutions in China (1994)   £10.00

The Reallocation of Resources to meet Global Shelter Needs   (1994)   £5.00

World Habitat Day 1993: Presentation of the World Habitat Awards in New York, USA (1993) (free)

Cities of the Future: Successful Housing Solutions in Singapore and Surabaya (1993) £10.00

A Guide to Low Cost Typhoon-Resistant Housing in the Philippines (1993) £10.00

World Habitat Day 1992: Presentation of the World Habitat Awards at the United Nations, New York (1992) (free)

Building for Hope in Costa Rica: Proceedings of the International Conference on Housing in Costa Rica (1992) £10.00

Housing through Support: Proceedings of the International Conference on the Sri Lankan Million House Programme (1991) £7.95

Houses Now! Building for Hope in Costa Rica (1991) £5.95

The World Habitat Awards 1985-1989 (1991) £15.00

Deterioration of the UK Public Sector Housing Stock (1990) £35.00

Regeneration of a Mining Town - Coalville into the 1990s - A Future without Coal? (1990)   £6.95

The House that Grows: Proceedings of the International Conference on Rural Low Cost Housing (1988) £6.95

Handbook of Readings on the Misallocation of Resources as a Cause of Homelessness (1987) £5.95

Inquiry into Leicestershire Housing (1986) £5.00

Bed and Breakfast: An Adequate Form of Temporary Accommodation or State-Financed Slums (1985) £5.00

Shared Ownership Housing in the UK (1985) £5.00

Shelter Against Nuclear Attack: Does Residential Housing Provide Effective Civil Defence? (1985) £2.50

Residential Housing and Nuclear Attack (1984) £11.95

S**elf Sufficient Co-operative Village** (1978) £10.00

5.3 Participants attending the Study Visit

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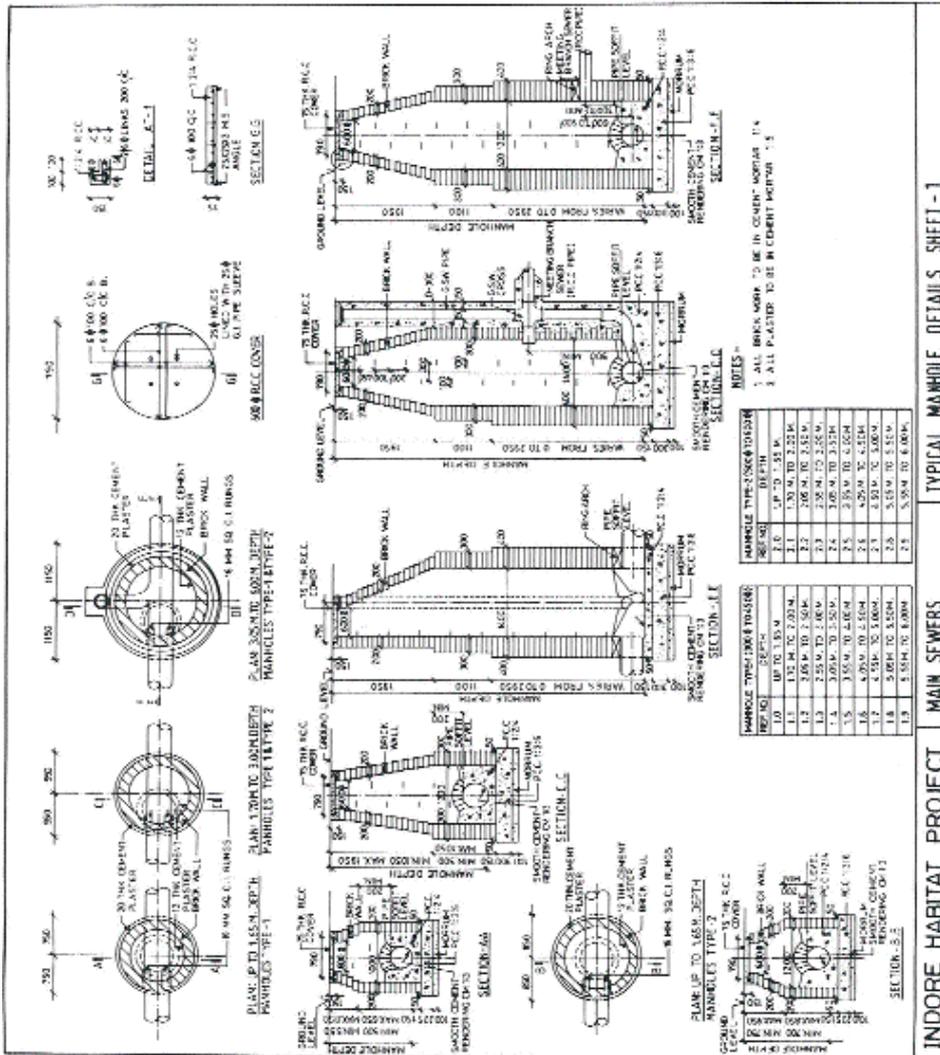Mercedes 1188 Ap. 401
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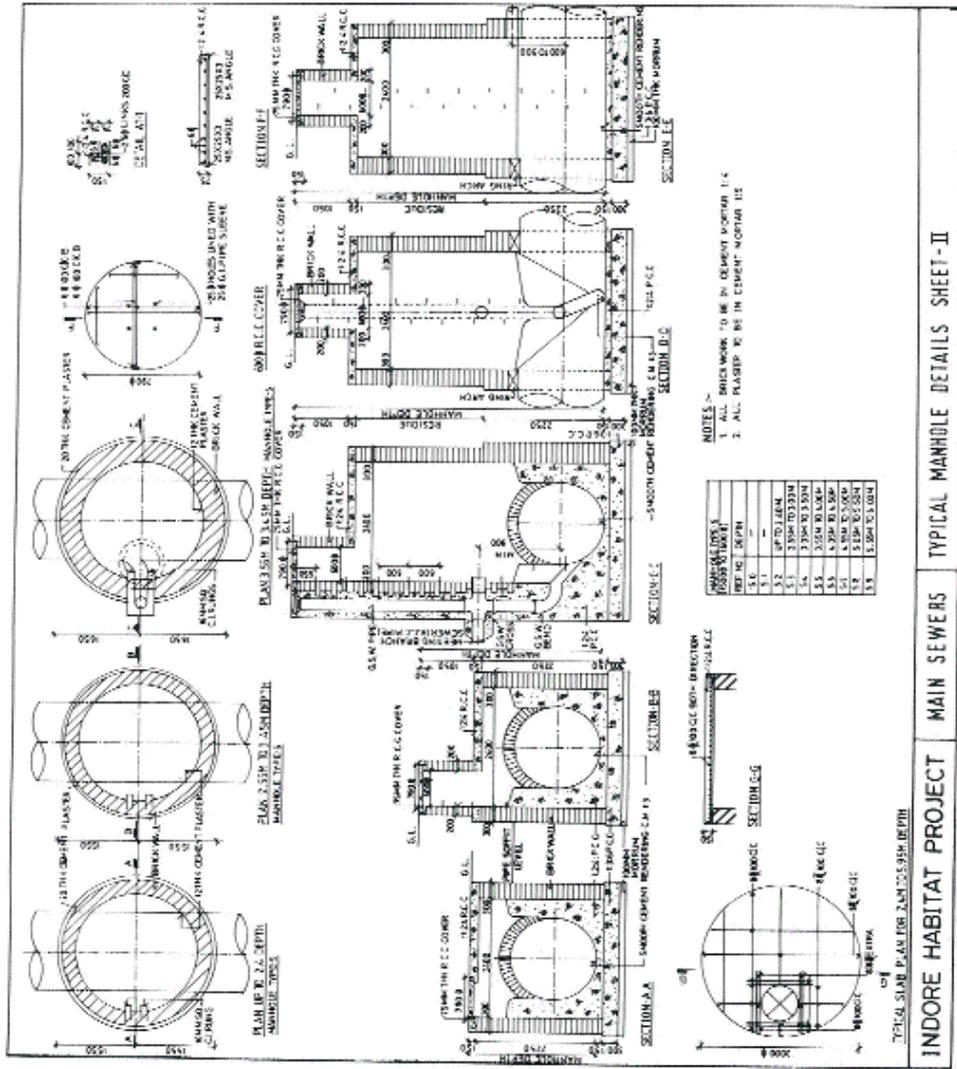
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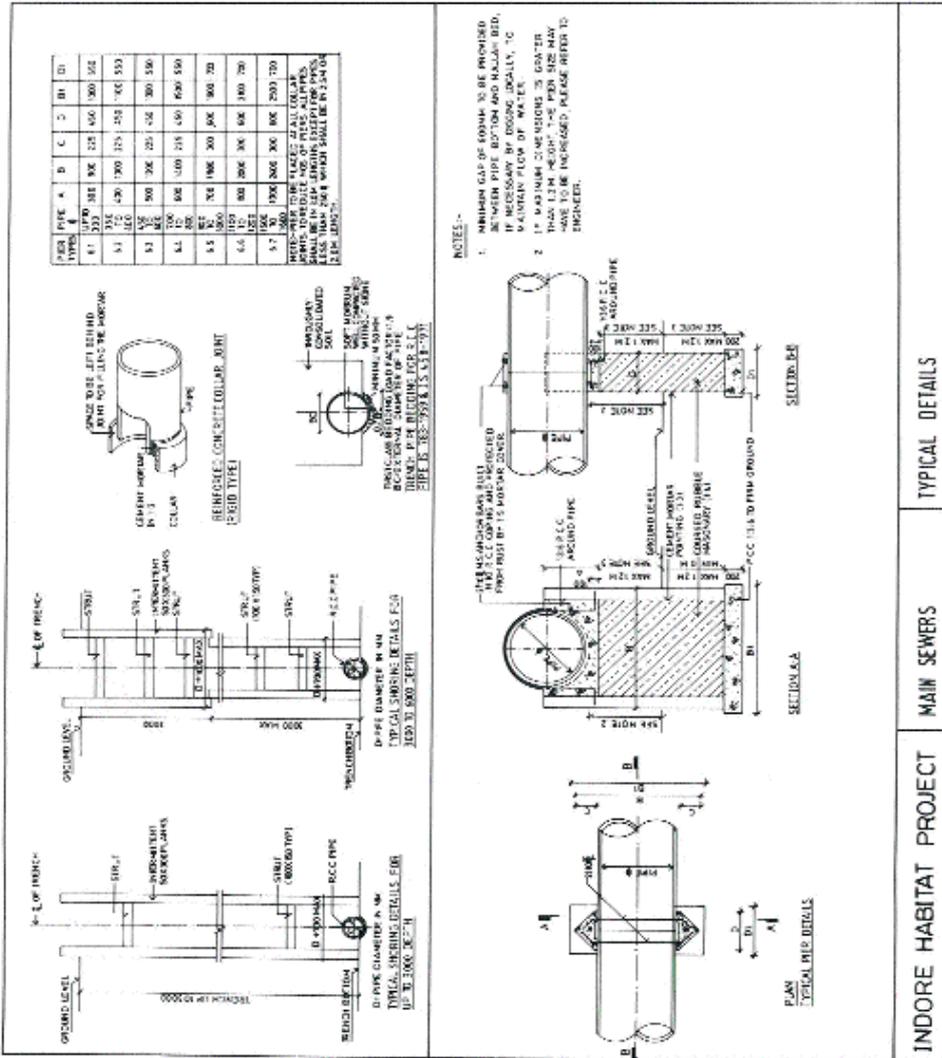Fax: +598-2-406063/984758

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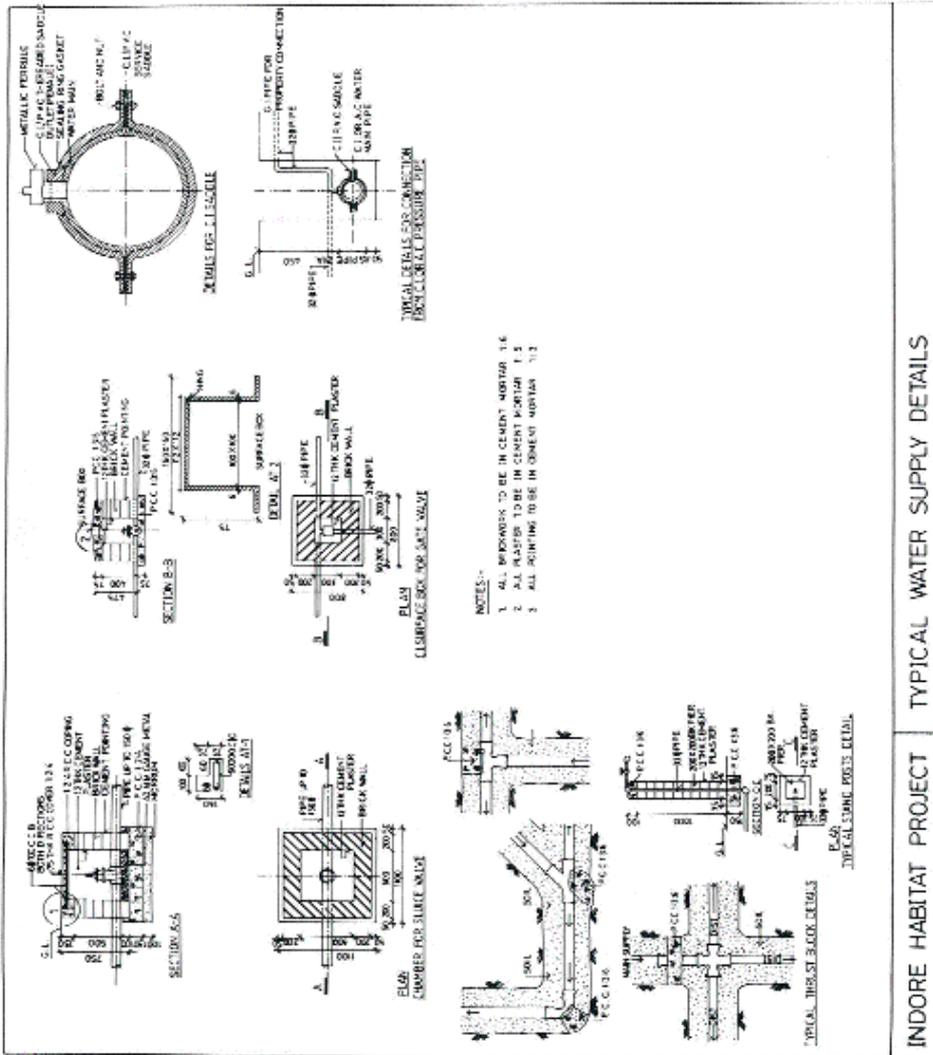Fax: +263-4-796409

Engineering Drawings

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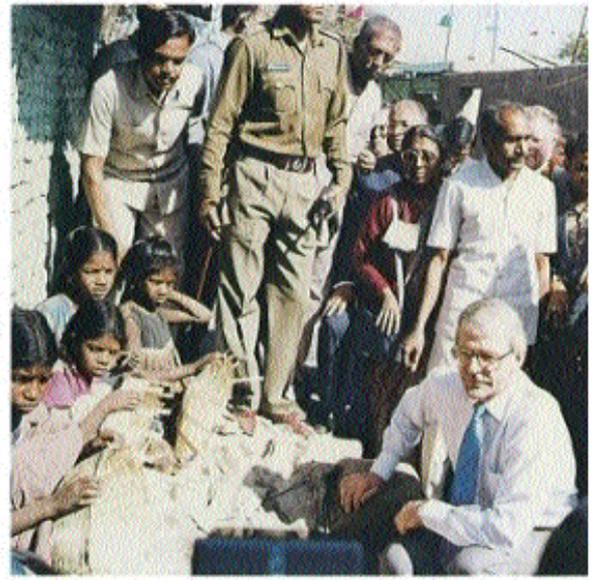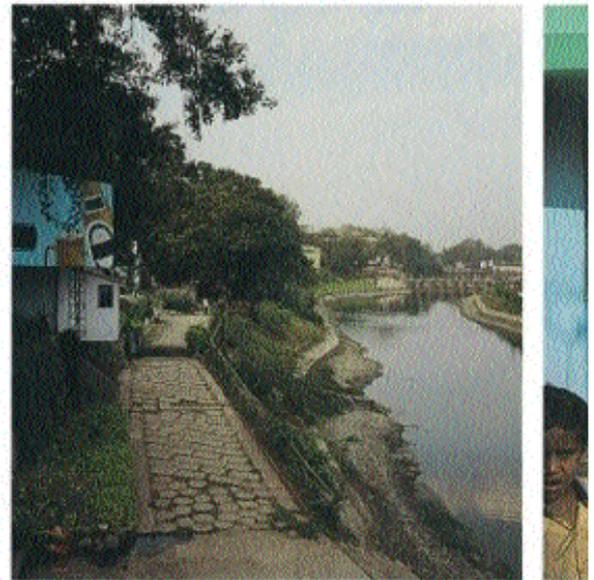INDORE HABITAT PROJECT | MAIN SEWERS | TYPICAL MANHOLE DETAILS SHEET - II

TYPICAL DETAILS — MAIN SEWERS — INDORE HABITAT PROJECT

INDORE HABITAT PROJECT | COMMUNITY HALL TYPE 34 | PLANS, ELEVATIONS & SECTIONS

INDORE HABITAT PROJECT | TYPICAL WATER SUPPLY DETAILS

INDORE HABITAT PROJECT | TYPICAL STORM DRAINAGE DETAILS

INDORE HABITAT PROJECT | TYPICAL SEWERAGE DETAILS

Slum Networking is an innovative and successful approach to slum improvement. Developed by Mr Himanshu Parikh, a leading Indian engineer, this award-winning approach was successfully pioneered in the Indore Habitat Project and is currently being implemented in other Indian cities, including Baroda and Ahmedabad.

Slum Networking is a city-wide, community-based sanitation and environmental improvement programme. It seeks to upgrade the infrastructure of an entire city by using the network of slum settlements around the city's drainage system as a starting point. The new infrastructure provided is linked to that of the existing city systems. The result is a dramatic improvement in the city infrastructure, with a piped sanitation system, clean rivers and a much improved road network. Moreover it is achieved at a fraction of the cost of conventional approaches and is now financially self-supporting.

The Slum Networking approach revolutionises the attitude to slums and slum dwellers. Rather than being a blight upon the city, slums provide an opportunity to improve the city as a whole. The approach also recognises the latent energy and skills of the slum dwellers and relies on their involvement in the improvement and on-going maintenance of their neighbourhoods.

The Indore Habitat Project won the World Habitat Award in 1993 for innovative and sustainable housing solutions. This book explains the slum networking approach in detail and describes its implementation in Indore, Baroda and Ahmedabad and seeks to encourage its replication and adaptation wherever human beings are living in sub-human conditions.