

IHS Project Paper Series

**Project Paper No. UEM18
Innovative urban environmental management in
Ilo, Peru**

**Doris Balvín Díaz, José Luis López Follegatti
and Micky Hordijk, Bolivia**

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*David J. Edelman Editor
Ed Frank, Project Manager*



**Institute for Housing and Urban Development Studies
Rotterdam, The Netherlands
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About the Project Paper Series:

The IHS Project Paper Series is published by the Institute for Housing and Urban Development Studies, Rotterdam to make available to an international audience the significant output of its projects in the fields of urban management, housing and urban environmental management. Far too often, project documents, the so-called 'gray literature', are not easily accessible to academics and professionals in the field. They do contain, however, relevant material. This series is an attempt to respond to this need by presenting such documents quickly and in a lightly edited form, under the supervision of the IHS Editorial Board.

Capacity Building for the Urban Environment: A Comparative Research, Training and Experience Exchange.

A project implemented by the Institute for Housing and Urban Development Studies (IHS), Rotterdam in co-operation with: Instituto de Desarrollo Urbano (CIUDAD), Lima, Institut Africain de Gestion Urbaine (IAGU), Dakar, Instituto para la Democracia Local (IPADEL), Lima, Human Settlements Management Institute (HSMI), New Delhi, Centro de Servicios para el Desarrollo Urbano (PROA), La Paz. This project was supported by: the Directorate General for International Co-operation (DGIS), Netherlands Ministry of Foreign Affairs, The Hague, and Swiss Development Co-operation, Federal Department of Foreign Affairs, Bern

Institute for Housing and Urban Development Studies

The Institute for Housing and Urban Development Studies (IHS), established in 1958, is an independent educational foundation based in Rotterdam, The Netherlands. IHS is active in the field of housing, urban management and urban environmental management in Asia, Latin America, Africa and Central and Eastern Europe. IHS offers post-graduate training, research and advisory services to national and local governments, multilateral and bilateral agencies and private companies.

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Introduction to the Capacity Building for the Urban Environment Project

Focus and Outline of the Project

Capacity Building for the Urban Environment is a comparative research, training and experience exchange project that was launched in October 1994 with the support of the Dutch government. It provides an inventory and review of the experiences of relevant bilateral and multilateral organisations and of Best Practices in urban environmental management. For the countries of India, Peru and Bolivia, it identifies, communicates and extends the application of Best Practices in environmental management for cities. In May 1995, the project was expanded to include Senegal/West Africa with the support of the Swiss government.

The focus of the project is on learning from experiences in urban environmental management at the city level and on developing strategies for capacity building in order to replicate and scale up the best of these experiences elsewhere. The overall co-ordination of the project is the responsibility of the Institute for Housing and Urban Development Studies in Rotterdam, while co-ordination in the participating countries is the responsibility of the following partner organisations:

- Human Settlements Management Institute (HSMI), New Delhi, India;
- Instituto para la Democracia Local (IPADEL), Lima, Peru;
- Instituto de Desarrollo Urbano (CIUDAD), Lima, Peru (since January 1997);
- Centro de Servicios para el Desarrollo Urbano, (PROA), La Paz, Bolivia, and
- Institut Africain de Gestion Urbaine, (IAGU), Dakar, Senegal.

Project Activities

Support to cities in the form of applied research and development activities in the area of urban environmental management has been, and continues to be, provided by the co-ordinating partner organisations through the following set of activities:

Research

Within the applied research programme undertaken in the project, Best Practices in urban environmental management in Bolivia, India, Peru and, to some extent, Senegal were identified, and their lessons and experiences reviewed. An analysis and review of the identified Best Practices then took place involving a large number of individual research groups and professionals. In a process of on-going monitoring and review, guidance and support were provided by IHS and its partner organisations. The results of both the individual studies of Best Practices and their review are being published in several books and papers in both English and Spanish. These and their publication dates are listed in the *Introduction to the Project Papers*, which follows this note.

Networking

In identifying the research priorities of the project, during the conduct of the research studies, and throughout the review of research findings, a structure was developed and utilised to ensure the participation of all interested and concerned individuals and institutions through a consultative process. Expert group meetings and consultative seminars were organised for this purpose.

Capacity Building Strategies

After the Best Practices research, analysis and review were completed for all countries, outline capacity building strategies were developed for each based on what was learned from these local experiences and practices. These strategies were developed through a broad-based consultation process involving a large number of research institutions, individual professionals and academics, city representatives, NGOs and local representatives. They are currently being modified based on the outcome and findings of Habitat II, which was held in Istanbul in June 1996, and the emphasis has now shifted to applying a number of Best Practices to selected cities.

Best Practices Documentation

Concurrent to and co-ordinated with this project, IHS served as the secretariat of and contributed to the review of the Best Practices that were submitted to the United Nations Centre for Human Settlements (UNCHS) for the *Global Best Practice Initiative for Improving the Living Environment* in preparation for Habitat II. HSMI, PROA, IAGU and IPADEL were also involved and contributed to the national preparatory processes that took place in their own countries. An overview of the Best Practice submissions to UNCHS, as well as summaries of the additional case studies received by IHS, are being made available on the Internet through the IHS Home Page.

Databases

Two databases are also under preparation: an institutional database and a literature database. The institutional database is being developed in co-operation with the International Institute for Environment and Development (IIED) in London. It contains entries on relevant organisations, some of which are documented in extensive profiles, while others are included as shorter reference information entries. IHS is developing the second database, which provides references in the literature on experiences with urban environmental management.

Rotterdam Seminar

The Rotterdam Seminar, which took place in May 1996 during the two weeks preceding Habitat II, brought together all principal researchers, as well as city representatives and other professionals involved in the project for a period of intensive discussions. The seminar resulted in a document that provided a comparative analysis of practices and experiences in the field of urban environmental management. This analysis included the project process and network building, governance, job creation and poverty alleviation and gender. This was published as a book in February 1997 and is listed later in the *Introduction to the Project Papers*.

The Rotterdam seminar also discussed *city-level capacity building strategies* for the cities of Calcutta, India; Ilo, Peru; Santa Cruz, Bolivia and Dakar, Senegal. Experiences in *urban environmental management* were reviewed for the cities of Tilburg, The Netherlands and Nairobi, Kenya.

Habitat II

At Habitat II the project was presented in the Special Meeting on Implementing the Urban Environment, organised by UNEP and UNCHS, as well as in other fora.

Capacity Building Strategies for Peru, Bolivia, India and Senegal

The outline capacity building strategies which were developed in preparation for Habitat II (i.e., by CIUDAD, PROA, HSMI and IAGU with the support of IHS). They are being modified for implementation, which is expected to begin late in 1997.

Outline Training Program for Local Officials, CBO Workers, and other Partners for Peru, Bolivia and India

These training materials are to be developed over the next few months and will comprise curricula for short courses related to the most directly applicable Best Practices identified for each country in view of its national strategy for capacity building in urban environmental management.

The Development of a Medium-Term Capacity Building Strategy for Senegal and West Africa

This activity is in progress and addresses the building of individual and institutional capacities at the local level for urban environmental management in both Senegal and throughout West Africa.

Ed Frank, Project Manager
Rotterdam, February 1997

Introduction to the Capacity Building for the Urban Environment Project Papers

A number of publications have appeared under the Capacity Building for the Urban Environment project. These are listed below and can be ordered from IHS or its partner organisations respectively:

- *Capacity Building for the Urban Environment*, edited by David J. Edelman and Harry Mengers, summarises the research findings of the project and the conclusions of the Rotterdam Seminar. It was published by the Institute for Housing and Urban Development Studies (IHS) in Rotterdam in February 1997;
- *Urban Environmental Management: The Indian Experience*, edited by B.N. Singh, Shipa Maitra and Rajiv Sharma, reviews the Indian experience in urban environmental management and presents all the Indian Best Practice of the project in detail. It was published by the Human Settlements Management Institute (HSMI) and (IHS) in New Delhi in May 1996;
- *Problems and Issues in Urban Environmental Management: Experiences of Ten Best Practices*, also edited by B.N. Singh, Shipa Maitra and Rajiv Sharma reports on the Indian Best Practices of the project in an abridged form. It was published by HSMI and IHS in New Delhi in May 1996, and
- *Ciudades para la Vida: Experiencias exitosas y propuestas para la acción*, edited by Liliana Miranda Sara, presents the Best Practices and outline capacity building strategies for Peru and Bolivia for a Spanish speaking audience. It was published as Volume 6 in the Urban Management Series of the joint UNCHS/UNDP/World Bank Urban Management Programme in Quito in May 1996.

The objective of this series of *Project Papers*, then, is to bring to an English speaking, audience the results of the project research in Peru and Bolivia appearing in the Miranda book. In addition, the Indian research, while documented in English in the second and fourth references listed above, has not appeared as complete, individual studies. Consequently, a selection of these will also be selected for this series. Finally, the first reference in the above list covers aspects of the research undertaken in all four countries of the project. Consequently the selection of work appearing in the *Project Papers* includes the following:

Bolivia

- 'Urban and Environmental Reality Workshops' by Zoila Acebey;
- 'Urban Agriculture in Community Gardens' by Julio Prudencio Böhr, and
- 'Institutional and Development Framework for Urban Environmental Management in Bolivia' edited by Gastón Mejía.

Peru

- 'Defence and Conservation of the Natural Swamp Area Pantanos de Villa, Lima' by Arnold Millet Luna, Eduardo Calvo, Elsie Guerrero Bedoya and Manuel Glave;
- 'Consultation in Urban Environmental Management: The Case of Ilo' by José Luis López Follegatti, Walter Melgar Paz and Doris Balvín Díaz;
- 'Promotion of Employment, Health and the Environment, Lima' by César Zela Fierro and Cecilia Castro Nureña

- ‘Environmental Sanitation and Infrastructure: The Case of the Marginal Urban Areas of the Southern Cone of Lima’ by Silvia Meléndez Kohatsu, Víctor Carrasco Cortez and Ana Granados Soldevilla, and
- ‘Inter-institutional Consultation and Urban Environmental Management in San Marcos Cajamarca’ by Marina Irigoyen and Russeles Machuca.

India

- ‘Power to the People: The Local Government Context’ by the Times Research Foundation;
- ‘Carrying Capacity Based Regional Planning’ by the National Institute of Urban Affairs;
- ‘NGOs/Civic Societies and Urban Environmental Advocacy’ by Development Associates;
- ‘Integrated Low-Cost Sanitation: Indian Experience’ by Sulabh International Institute of Technical Research and Training;
- ‘City-Wide “Best Practices” in Solid Waste Management in Collection, Transportation and Disposal’ by HSMI/WMC of UIFW;
- ‘Environmental and Health Improvement in Jajmau Area, Kanpur: Lessons and Experiences for Wider Replication’ by Ministry of Environment and Forests;
- ‘An Approach to Pollution Prevention in Electroplating Sector’ by Development Alternatives;
- ‘Integrated Study on Wetlands Conservation and Urban Growth: A Case of Calcutta's Wetlands’ by Institute of Wetlands Management and Ecological Design;
- ‘Sustainable Urban Development: A Case of Navi Mumbai (New Bombay)’ by City & Industrial Development Corporation;
- ‘Community Based Sanitation and Environmental Improvement Programme: Experiences of Indore, Baroda and Ahmedabad’ by Shri Himanshu Parikh, and
- ‘Institutional and Development Framework for Urban Environmental Management in India’ by HSMI.

It should be emphasised here that the nineteen *Project Papers* in this series reflect the views of their authors only and have been edited to varying degrees. Initial English language editing was done by, among others, B.N. Singh, S. Maitra and R. Sharma for India and by D.J. Edelman for Peru and Bolivia. In fairness to both the authors and the publishers, they should, therefore, be characterised as working papers rather than full academic papers.

David J. Edelman, Series Editor
Rotterdam, February 1997

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Innovative urban environmental management in Ilo, Peru

Doris Balvín Díaz, José Luis López Follegatti and Micky Hordijk

SUMMARY: *This paper describes how the local authorities and population of a small city in Peru addressed the environmental problems they faced from a large copper mine, the fishmeal industry and a lack of basic investment in infrastructure. It shows how an innovative and committed local council was able to work with the industrial concerns and the inhabitants in developing a long-range plan to reduce industrial pollution and to improve housing conditions and the living environment through support for community organization and self-help in both new and established low-income settlements. Strong local democracy proved to be a key factor in this success.*

Doris Balvín Díaz is a lawyer, and founder and current director of the NGO Labor. She also worked with the Municipality of Ilo and was chairman of the Permanent Multisectoral Committee on Environment. Labor originally focused on work with trade unions but, for over seven years, has worked in the field of local development, urban development and urban environmental management.

José Luis López Follegatti studied psychology and education and has worked in the field of urban planning since 1987. He came to Ilo in 1987 and from 1992-1995 was director of the NGO Labor. He recently moved to Cayma in Arequipa where he now works as head of the planning department.

Micky Hordijk is a geographer, specializing in urban environmental management. She is currently carrying out her PhD

I. INTRODUCTION

SINCE THE 1950s, some of Peru's secondary cities have experienced a rapid growth in their populations due mainly to the exploitation of important natural resources (see Table 1). These cities include Chimbote with developments in its fishmeal and ferro-metallurgic industries, Talara with its oil refinery, Pisco with fishmeal and steel industries, La Oroya with its metallurgic industry and Ilo with its fishmeal and copper industries. The economic activities located in these five intermediate cities account for 50 per cent of Peru's foreign exchange.

In these cities, the industrial sector has developed with little thought being given to the urban expansion that has followed. In some cases, these cities have grown from what were essentially camps for industrial workers; in other cases, the initial urban structure was an industrial site surrounded by squatter settlements. In all cases, economic growth has resulted in an unbalanced spatial structure dominated by the industrial sector and accompanied by a lack of housing, basic services and other facilities. These problems are aggravated by the severe environmental degradation associated with uncontrolled industrial development. Although some of these cities belong to the most prosperous areas in the country when judged by their contribution to Peru's GNP, they are also known to have among the most polluted and unhealthy environments.

The smallest of these "economic enclaves", Ilo, is often cited

Table 1: Population Growth in Some of Peru's Secondary Cities

	1941	1961	1972	1981	1993
Chimbote	4,000	60,000	160,000	217,000	267,000
Talara				57,000	82,000
Pisco	14,000	22,000	41,000	27,000	54,000
La Oroya	13,000	25,000	25,000	34,000	29,000
Ilo	1,000	10,000	21,000	38,000	44,000

research on the role of local initiatives in urban environmental management in Lima, Peru (University of Amsterdam, Department of Human Geography and Centre of Latin American Studies and Documentation, and the Institute for Housing and Urban Development Studies in Rotterdam, the Netherlands).

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*This paper describes research undertaken within the programme "Capacity Building for the Urban Environment: a comparative research, training and experience exchange" which has been financed by the Dutch Ministry of Foreign Affairs as a contribution to the Habitat II Conference. The programme analyzes best practices in Urban Environmental Management in Peru (5), Bolivia (2), India (10) and Senegal (1). Based on the project results a Capacity Building Strategy for Urban Environmental Management will be formulated for each country involved, and forwarded to Habitat II. For further information on the project contact the Institute for Housing and Urban Development Studies: IHS, PO Box 1935, 3000 BX Rotterdam. **Tel:** 00-31-10-4021523; **fax:** 00-31-10-4045671; **e-mail:** 100565.3122@compuserve.com.*

as an example of very poor environmental conditions. "Ilo is a city to work in, not to live in" is a common saying among its inhabitants. The mining company, Southern Peru Copper Corporation (SPCC) is the city's main polluter. Some idea of the scale of pollution is given by the 1,920 tonnes of sulphur dioxide that the Southern Peru Copper Corporation emits into the air each day, making it one of the world's top five producers of sulphur dioxide. The amount of water used by the Corporation in its production process draws heavily on the very limited freshwater resources of the region. The Corporation has also destroyed 20 kilometres of coastline by dumping 30 million metric tonnes of untreated mining waste into the ocean each year. Both beaches and the ocean are heavily polluted, forming a very serious threat to the town's second most important economic activity, fishing. There are no studies to show a direct link between health problems and the mining activities in Ilo but, over the last five years, the Ministry of Health has reported an increase in the incidence of respiratory ailments, cancer, urinary and circulatory diseases.

What is less well-known is that Ilo has experienced a very innovative form of urban management over the past decade which has led to considerable improvements in both environmental conditions in the area and in the living and housing conditions of its inhabitants. A key factor in this process is the high degree to which the local government is prepared to share power with its citizens. The participative planning strategy developed in Ilo may also be useful for other small cities in Latin America. In this paper, we outline Ilo's main problems and then describe the planning strategy and its most striking results. This strategy is illustrated through a discussion of two particular institutions:

- The Permanent Multi-sectoral Commission on Environment which brings together the very different sectors (including the industrialists, the municipality and the citizens). The Commission's first task was to analyze the environmental consequences of the industrial activities and urban growth and to monitor the implementation of a programme to address these problems.
- The Management Committees: neighbourhood committees of local residents formed to improve environmental and living conditions. These committees are supported by local government and an NGO.

The paper concludes with a summary of the most important factors underlying Ilo's successful strategy.

II. A BEGGAR AT A BANK OF COPPER?

ILO IS A small coastal city in the very south of Peru, 1,250 kilometres from Lima and close to both the Bolivian and Chilean borders. It is situated in the Atacama Desert which occupies a small piece of land along the coast.

Ilo's population grew rapidly from 1940 to the end of the 1960s. From a fertile valley where 3,000 inhabitants cultivated olives and vines, the area changed into an industrial campment when the Southern Peru Copper Corporation built its gigantic plant first with two and then four smokestacks. A few years later, the fishmeal industry, which was then growing in national prominence, also established itself in Ilo. As a result, the whole town's development was shaped by the industrial sector which controlled 70 per cent of the land suitable for urbanization.

In the three decades from the beginning of the 1940s, the number of inhabitants multiplied twenty-fold. The number of migrants from the Andean highlands increased reflecting a deterioration in the living conditions in the area and the growth in urban employment opportunities. The migrants brought their own cultural inheritance and language (*aymara*) which have not always mixed easily with the traditions of the farmers and coastal fishermen. However, the willingness of the Iloian people to organize themselves is also ascribed to this *aymara* background.

The Moguera mines proved prosperous. The mining Corporation managed to increase its revenues from US\$ 450 million in 1993 to US\$ 800 million in 1995 with an increase in its profit from US\$ 43.6 million to US\$ 200 million during the same period. The Southern Peru Copper Corporation is the eighth largest copper producer in the world providing 5,500 jobs and 17 per cent of Peru's export income. The three fishmeal factories offer direct employment to 600 of the city's residents and support another 400 jobs in the fishing industry. The output from these factories represents 15 per cent of the Peruvian fishmeal production.

III. ILO'S ENVIRONMENTAL PROBLEMS

THE INDUSTRIAL PRODUCTION has had very serious environmental consequences. The sulphur dioxide discharged by the Corporation causes constant atmospheric pollution. It generally means that visitors to the city suffer from sore throats and irritated eyes within a few hours. If the wind blows from the wrong direction, "los humos" (dark toxic clouds) drift into town and drivers have to switch on their lights and residents stuff rags under their doors to try and stop the fumes from seeping into their homes. Mining waste is dumped at sea and includes an estimated 176,000 metric tonnes of lead, 7,368 metric tonnes of arsenic and 1,933 metric tonnes of cadmium each year. This

causes changes in the marine life over an area that stretches more than six kilometres out to sea. Settling and dispersion of mining slag are causing geomorphological changes along a six-kilometre stretch of the shoreline. A further problem for the city and the surrounding agricultural activity is the scarcity of freshwater. The natural wells that previously provided water to the city dried up at the beginning of the 1970s due to over-exploitation. The Corporation requires 1,700 litres per second for its production.

The rapid growth in the city's population and urbanized area has also contributed to the poor environmental quality. The discharge of domestic waste-water into the sea meant that it was so polluted with faecal coliforms that the beaches were no longer attractive to tourists and the quality of the seafood declined. In the 1980s, over 30 per cent of domestic solid waste remained untreated. Ninety per cent of the roads in squatter settlements in the intermediate zone - between the coastal area and the plateau - were unpaved leading to serious dust problems in this very arid climate. Poor transport connections between the plateau and the lower areas meant that densities in the coastal areas increased as no other expansion areas were available.

By the beginning of the 1980s, Ilo had three distinct areas: the old centre of the fishing town, the "new town" ("*pueblo nuevo*") which grew out of the industrial camp and the "*pueblos juvenes*" (literally "young settlements" - a name commonly used in Peru for illegal or informal urban settlements) where the migrants settled. A railway connection built by the Corporation for its production process separated the old town from the newer parts.

IV. TURNING COPPER INTO GOLD

a. How Ilo's Improvement Began

IN 1981, THE left-wing party *Izquierda Unida* (United Left) won the local elections. After undertaking some much needed reforms in the administration, the first important initiative was the approval of an Urban Development Plan in 1984 which initiated discussions on urban land use. Since then, this Plan has formed the basis of all other plans produced and it has proved to be an important starting point for change. The guiding principles of the Plan are:

- to improve environmental quality and living conditions in the city;
- to integrate the segregated parts of the city;
- to relate the city to its surrounding environment;
- to strive for sustainability;
- to develop an approach based on consultation and popular participation.

b. Consultation as a Political Tool

The strategies through which the urban authorities encouraged popular participation and partnerships in Ilo have proved to be important and, within these strategies, *concertación* (consultation) plays a major role. In Ilo, consultation does not only imply asking people their opinion but also involving them in decision-making. *Concertación* is "...a process of negotiations in which the different actors are recognized as legitimate partners, capable of developing and implementing strategies, sharing a clear vision of the future and respecting a common interest."⁽¹⁾ In practice, this means that all direct stakeholders in a certain area or sector are invited to join discussions on specific topics and form a committee. Agreements reached by consensus in this committee are taken as a political decision and are implemented. Only when a decision by consensus cannot be reached does the decision fall back into the hands of the Mayor.

One of the first committees formed in this way (in the second half of the 1980s) was the committee on urban transport. It involved drivers, trade-unions, the municipality, community leaders and small traders. The task was to improve the urban transport system. In the past, tariffs were set by the municipality but this commission came up with a new system of tariffs and new transport routes. In this way, many decisions previously taken by the municipality are now taken in a forum where all the actors directly affected are represented.

The main preconditions for *concertación* are a clear and stable leadership, a community able to express its needs, a democratic tradition which values and recognizes the perspectives of the different sectors, and individuals and groups able to formulate concrete projects and plans within the framework of an overall vision of development.

Each of these factors is present in Ilo. The political leadership has remained in power since the 1981 elections and the leaders are still working on the implementation of the Urban Development Plan produced during the first term. Through a more participatory approach, the residents and their community organizations have learned to express their needs. Support has been given by two local NGOs who have become important partners for both the municipality and the residents of low-income settlements. As a result of the industrialization, Ilo has a tradition of strong trade unions and this has proved to be a further advantage. Added to this is the culturally inherited attitude of the Aymara Indians which is a favourable factor for a strong local democracy. Finally, the Urban Development Plan has been designed as a step-by-step approach towards long-term goals of sustainable development.

It took a lot of work and the Mayor, his staff and the NGO had to attend many meetings; but now, all Iloans share the same vision of their city. Ilo is - and will be for at least the coming decade - a city under construction. It is a city that has been built mainly by its inhabitants, and their resources - both human and financial - have provided the main source of invest-

1. López Follegatti, José Luis, Walter Melgar Paz and Doris Balvín Díaz (1995), "La concertación en la gestión ambiental urbana: la experiencia de Ilo", Ilo, November.

ment. Most inhabitants live in squatter settlements but much can be done to assure a decent standard of living.

As important as the concrete results has been the formation and development of a team of local leaders that are able to work together to manage the city. The first group is made up of the municipal employees headed by the charismatic Mayor. The second is staff from the NGO *Labor* and a group of neighbourhood leaders from the Federation of Squatter Settlements. This Federation represents all neighbourhood organizations from the 14 *pueblos jovenes*. Its executive committee is composed of the leaders from the neighbourhood organizations (50 per cent) and representatives elected in annual public assemblies. The Federation - whose main task is to represent the inhabitants of the squatter settlements in all the different communities - is a very important partner in the process.

These leaders are supported by other NGOs working in the city, by the water company SEDA-Ilo, by representatives from the farmer's organizations, by employees of the Ministry of Health, school teachers, journalists, nurses, fishermen and miners, the women's federation and even certain private enterprises. The number of local leaders exceeds 200. The first group provides a stable political leadership but it could not be so successful without the full support of the second broader group.

In 1987, Ilo received unexpected support. Discussions began at national level on market integration between the *Mercosur* countries (Brazil, Paraguay, Argentina and Uruguay) and the Pacific coast countries of Asia. Much of the transport between the east of the continent and Asia has to use the Panama canal or go round the southern cape of Chile. A port that could serve the existing railway connection between Brazil and Bolivia would improve communication links considerably. The local leaders made use of this opportunity and presented Ilo as a possible future "international port". A first but substantial step in this process was the "Convent Mariscal Andres Santa Cruz" signed by the presidents from Peru and Bolivia on 23 January 1992. In this, Peru allowed Bolivia - a landlocked country - a 40-year tenureship of a part of Ilo's beaches, the port and the shore. Substantial investments were committed to large infrastructure projects including an airport, and the highway connecting Ilo to Bolivia's capital La Paz was paved. Ilo was also declared a free trade zone and 120 hectares of the shoreline were reserved for this and as an industrial zone for Bolivia.

Most of Ilo's inhabitants do not profit directly from these changes. However, they had the psychological effect of encouraging the Iloans to develop a positive vision of the future, motivating them to invest in the city.

c. The Permanent Multi-sectoral Commission on Environment

In 1987, as a response to popular protest, the municipality formed the "Multi-sectoral Technical Commission" (CMT). This Commission had to evaluate the environmental impact of the

industrial activities and come up with solutions. Central government (i.e. the ministries of Housing and Construction, Health, Agriculture, Mining and Energy), the Peruvian Institute of Marine Conditions (IMARPE), local government (the Mayor of Ilo) and Southern Peru Copper Corporation were all represented on the Commission. The first step the Commission took was to extend the scope of its work to include the environmental impacts of urbanization and the fishing industry. The Commission presented its conclusions and recommendations in a document entitled the "Environmental Rehabilitation of the Southern Zone of Peru" which was signed by all the partners involved. The Commission, including the Southern Peru Copper Corporation, agreed to the following project proposals:

- Building of a treatment plant to reduce sulphur dioxide emissions; the estimated costs of US\$ 108 million to be paid by Southern Peru Copper Corporation.
- Construction of tailing ponds to treat mining waste; the estimated costs of US\$ 40 million to be paid by Southern Peru Copper Corporation.
- Construction of a retaining wall for slag; the estimated costs of US\$ 860,000 to be paid by Southern Peru Copper Corporation.
- Improvements to the solid waste collection and treatment system which include the introduction of micro-enterprises and building a sanitary landfill for final disposal. The costs of the landfill to be shared between the government, *Labor* and the micro-enterprises.
- Improvements to the sewage system including wastewater treatment in oxidation lakes. The privatized water company (SEDA-Ilo) to provide the required US\$ 10 million.
- Reforestation of 300 hectares in the desert using treated wastewater for irrigation. The trees to be paid for by the Federation of Squatter Settlements (US\$ 56,136), *Labor* (US\$ 52,300) and the Municipality (US\$ 126,000)
- Implementation of the Urban Development Plan.

The Permanent Multi-sectoral Commission on Environment was responsible for monitoring the implementation of the Rehabilitation Plan which was to cover the whole of the province of Ilo. This Commission includes representatives from all the affected municipalities and representatives from the squatter settlements, from farmers from the valley and from regional government. The Southern Peru Copper Corporation was kept under constant pressure. In 1992, it was brought before the International Water Tribune in Amsterdam whose jury judged it guilty of contaminating Ilo's water resources. Although the Water Tribune has no judicial power, the international public attention was damaging to the Corporation. A direct result of this case was that the Corporation was forced to change from its preferred choice of discharging partially treated mine waste into the ocean to building an underground depository, an option which costs twice as much. The sulphur dioxide treatment plant has been built and began operating in September 1995. The

construction of tailing ponds has begun. So far, 20 hectares of desert are irrigated with wastewater including a part planted by Southern Peru Copper Corporation; and the micro-enterprises are functioning. Two micro-enterprises collect waste in areas inaccessible to municipal trucks, two others take care of the final disposal. They coordinate with workers from the Municipality to ensure that the waste they collect is further treated.

d. Local Democracy in the Management Committees

Much of the local work done in the city is executed through *comités de gestión* or management committees. When the first committees were formed in the late 1980s, they had only limited power. They were instituted by the Mayor as advisory bodies - to advise on new norms and regulations. The committees sought to involve all stakeholders, as illustrated by the committee on urban transport. The strategy used was the same: agreements reached by consensus in these committees were ready for implementation.

The scope of the management committees was soon extended and, today, they function as primary catalysts for small projects. In the committees, problems are discussed, goals established and the different ways to achieve the goal identified. The heterogeneity of the committee members contributes to innovative solutions. Once a certain approach is chosen, responsibilities are assigned to the different parties. Many of these committees are now formed solely from local residents and they seek relationships with other actors such as the Municipality, the Federation of Squatter Settlements and NGOs. In principle, the projects proposed have to be self-financing. However, the Municipality often contributes technical assistance and necessary heavy equipment, the NGO contributes loan finance from a revolving fund and the community contributes labour and pays for concrete and other necessary materials (see Table 2).

Local residents pay for most of the costs. For example, to pave a road with an area of 480 square metres in one of the squatter settlements required an investment of US\$ 4,278. One-third was paid for by the local government, two-thirds by the community.

In the last five years, almost 200 committees have been formed.

Table 2: Responsibilities of and Investments by the Different Parties

<i>Comité de gestión</i>	Municipality	Federation of squatter settlements	NGO
<ul style="list-style-type: none"> • Unskilled labour • Organizing community • Monitoring and maintenance of the project • Concrete • Combustible 	<ul style="list-style-type: none"> • Design • Technical assistance • Skilled labour • Machinery and equipment 	<ul style="list-style-type: none"> • Land • Trees • Promotion of the organization • Technical supervision of the reforestation 	<ul style="list-style-type: none"> • Environmental education • Assistance in community building • Assistance in reforestation • Revolving fund for concrete

SOURCE: López Follegatti, José Luis, Walter Meigar Paz and Doris Balvín Díaz (1995), "La concertación en la gestión ambiental urbana: la experiencia de Ilo", Ilo, November.

Most were initiated to pave roads, create green areas and recreation areas or to help build a boulevard with an amphitheatre along the coast. Over 40 per cent of the households (or over 4,000 families) living in squatter settlements in the centre of the city have participated in one or more projects. As one community leader noted:

"Years ago, the boulevard we have nowadays was nothing more than a big dusty slope, where we threw our waste away and which we used as a public latrine. For us it was impossible to reach the other zone of the city and we suffered from the mosquitoes and from the diseases our children caught when they played in this area. It seemed impossible to change this situation. We needed several meetings to persuade the people and to plan the work. But we managed." (Senora Mendoza).

Table 3

Type of project	Number	%
Paving roads, creation of green areas	149	78
Boulevards and parks	16	8.4
Installation of basic services	12	6.3
Construction of local institutes	6	3.1
Sporting and recreation facilities	8	4.1
Total	191	100.0

Table 4

Project	Number
Roads paved	114
Houses painted	5180
Trees planted on the sidewalks etc.	6,000

SOURCE: López Follegatti, José Luis, Walter Melgar Paz and Doris Balvín Díaz (1995), "La concertación en la gestión ambiental urbana: la experiencia de Ilo", Ilo, November.

V. PREPARATION FOR THE FUTURE

AS NOTED EARLIER, 70 per cent of the land suitable for urban development in the city is controlled by the industrial sector. It is now recognized that the plateau can provide room for the expansion of the city but urbanization on the plateau is not without problems. It is costly to provide the inhabitants with the basic services and roads have to be built to connect the new area ("Pampas Inalámbrica") to the city centre. However, the municipality has started to prepare the city for further growth.

When new migrants arrive and invade part of the desert around

Ilo, they are told: "You are welcome in Ilo, we will help you to build up your home and your life but only if you are willing to invest in our city and follow our rules." New inhabitants have to accept the structure of the plots and the neighbourhoods laid out by the Municipality. Shortly after they have received legal tenure of their plots, the households have to pay the costs of laying them out and a team from the Municipality organizes a workshop to build latrines. The inhabitants pay for the materials and have to build the latrines themselves although the Municipality indicates the corner of the plot where the latrine has to be built. This is so that it will be easy to connect the latrines to the sewage system once it reaches the plateau.

Public taps are installed, one tap per 100 households. The households are responsible for maintenance and have to collect the monthly fees. The water company (SEDA-Ilo) pays for the pipelines and the households have to pay for the taps and, at a later stage, the costs of connecting their households to the main pipeline. As the water company noted, "...we see these new migrants as our future clients and try to establish a good relationship with them from the beginning." Once the latrines are built and the public taps installed, people begin to develop their houses. Due to Ilo's special status as a "bi-oceanic port city", it receives a disproportionate share of finance from a national credit scheme for housing. People can obtain a loan for building materials relatively easily.

The Municipality offers further support through technical assistance. Several years ago, architecture students were invited to Ilo to design houses for the new settlements. They spent some time in the city, talking with the newcomers to learn of their needs and priorities - and then designed houses according to what they heard. One of the main requirements was for houses that could be built incrementally so that the designs could be used by households only able to afford a house over a period of 10 years. The Municipality organized a competition. During an exhibition of the housing models, the people from Pampas Inalámbrica were asked to vote for the best design. Five winners were selected: four residential housing units and one unit combining residential use and commercial activities. Building plans for the five winning designs are available from the Municipality at no cost and people can also hire municipal technicians at relatively low cost to help with the building. Of course, they are free to build other houses but this requires them to hire their own architect and technicians. It is proposed that the newer urban areas will be developed further with the same *comités de gestión* as in the older parts of the city.

With this "enabling strategy", the Municipality has provided 10,000 serviced plots over the last seven years and further developments are continuing. At present, they are laying out the fifth and sixth extension areas and plans are ready for the seventh and eighth. Future extensions are already noted in city masterplans.

To increase the supply of fresh water, at the beginning of the 1980s a pipeline was built to connect Ilo to a natural well in the mountains 60 kilometres away. This solved the problem of water

scarcity. Between 1985 and 1990, several boulevards were built, connected by stairs, to reduce the problem of spatial segregation. Using the stairs - built and maintained by the inhabitants - most citizens can easily reach the sea. Once this work was completed, the city was ready for the implementation of the environmental recuperation plan which included:

- The enforced modernization of the production process in the Southern Peru Copper Corporation to reduce emissions and waste;.
- Treatment of 97 per cent of domestic wastewater which has greatly reduced the contamination of the beaches. Wastewater is treated in oxidation lakes close to the city with a capacity of 250 litres per second. Purified water is used to irrigate a forested area of 70 hectares - which is to be extended to cover 200 hectares.
- The implementation of an improved system of solid waste collection with micro-enterprises and small treatment plants. Today, 95 per cent of the city's solid waste is collected.
- The implementation of a project for three small bio-filters for wastewater treatment. They have a capacity of two litres per second and this water is used to irrigate the hillsides. Now, some of the hills are green again which makes the city a more agreeable place to live and prevents some of the dust pollution.
- Two-thirds of the roads in the city being paved, thus reducing the amount of dust in the air. Many of the roads have trees planted on the pavements.
- Large-scale reforestation and the creation of green areas in both the city and the province of Ilo.
- Planning and implementation of extension areas "Pampas Inalámbrica" and 10,000 serviced plots produced in seven years.

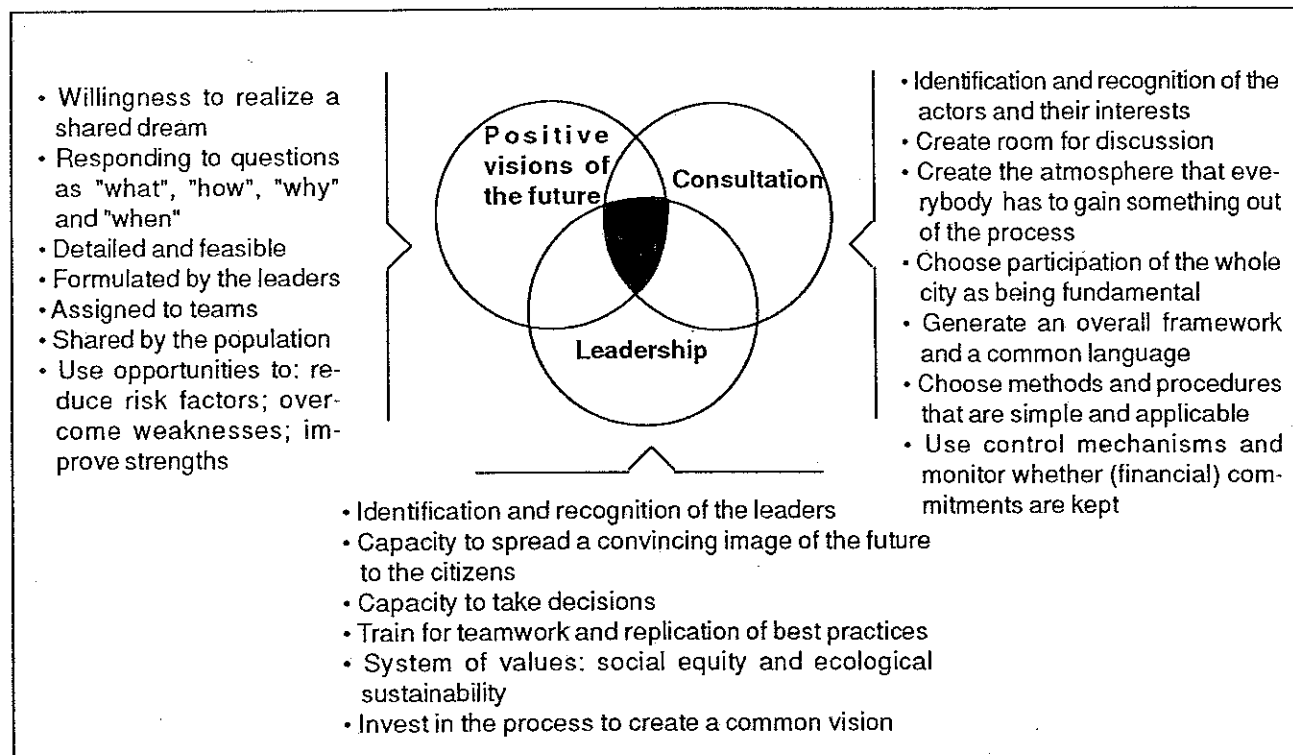
VI. LESSONS LEARNED

OF COURSE, THE achievements noted above have not solved all of Ilo's environmental problems. The sulphur dioxide emissions remain Ilo's main environmental problem as the new treatment plant affects only 18 per cent of the emissions. But, on all other issues, the Iloans have won. Their city is nicer, cleaner and more attractive. As a result of the treaty between Peru and Bolivia, investments in heavy infrastructure (the airport and the regional highway) have improved Ilo's accessibility. And, as a result of their own activities, the Iloans have improved their own living conditions: they have paved their roads, built their latrines, painted their houses and planted their trees. The Municipality seeks solutions that are ecologically sustainable - for instance wastewater used for reforestation on part of the desert and, on a smaller scale, in windmill driven bio-filters to green the hills again. And, as a sign of the acceptance of the forced marriage with the Southern Peru Copper Corporation, the main coastal boulevard is paved with reused waste from their mines.

Three factors can be identified which underpinned Ilo's successful strategy (illustrated in Figure 1):

- a stable and reliable leadership;
- a clear vision of the future;
- policy-making developed through a widespread consultation process involving all actors in decision-making.

Figure 1: Three Elements to Create Changes



The same leaders have remained in power for five consecutive terms. Recently, they were re-elected for a sixth further three years. (Figure 2. summarizes some key factors during this period.) Although the Mayor has changed once, this has meant no change in policy. The current Mayor talks as enthusiastically about the Urban Development Plan as his predecessor did. The inhabitants understand that their city is, and will be, a city under construction which will mainly have to be built by their own efforts. Their activities are coordinated within the framework of the Urban Development Plan. This shared vision and hope for the future underlies the city's struggle for improvement. Ilo is also an important example for international funding agencies as it shows what can be achieved with relatively little external finance.

But, when one of the more powerful individuals behind Ilo's development was asked what factors lay behind its success, he admitted: "It is not just that we did a good job. We were also very lucky: we had the right people in the right place at the right time and they were able to act together when circumstances were favourable. Ilo is not that easy to replicate, you have to know how to make use of the possibilities a situation offers." The first successful Mayor started to dream of a better city in

Figure 2: Key Factors in Ilo's Experience

	1980 - 1984	1985 - 1989	1990 - 1995
BASIC FACTORS	<ul style="list-style-type: none"> Scale of the city • Intermediate Geopolitical position • Bioceanic port city Natural resources • Copper, fish Ecological characteristics • Hyper-arid, deteriorated and non-natural Socio-cultural • <i>Aymara</i> migrants, tradition of communal work 		
MENTALITY	<p>Popular protest</p> <p>Social conflicts, confrontation</p>	<p>Positive vision of the future</p> <p>City where everybody can live</p> <p>Capacity to negotiate</p> <p>Consultation also for environmental issues</p> <p>Flexibility</p> <p>Political will</p>	<p>Bioceanic port city</p> <p>Consultation as an accepted and legitimate tool</p>
STRATEGIES	<p>'83 Identification and implementation of some small strategic replicable pilot projects</p> <p>'83 Formulation of an overall vision of the future in the Urban Development Plan</p> <p>'85 Introduction of consultation as a political tool, Implementation of projects.</p> <p>Start of the work of the Permanent Multi-sectoral Commission on Environment.</p> <p>Formulation of the Environmental Rehabilitation Plan</p> <p>'83 Including environmental issues in decision making.</p> <p>Development institutions committed to environmental issues.</p> <p>Continuity of leadership</p>		

1981. But all the major projects have only been carried out in the last five years, after he stepped down. It takes a long time to pass from dream to reality. But, as they say in Ilo, "Dreams without actions are useless, actions without dreams make no sense. But when dream and action unite a positive vision of the future is born."

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