

**PROCEEDINGS:
THIRD ASIAN CONFERENCE ON
LOW INCOME SHELTER
AND HOUSING
FINANCE**

SPONSORS:

**OFFICE OF HOUSING AND
URBAN PROGRAMS**

**U. S. AGENCY FOR
INTERNATIONAL
DEVELOPMENT .**

**GOVERNMENT OF
SRI LANKA**

**COLOMBO, SRI LANKA
OCTOBER 1982**



Proceedings:

3RD ASIAN CONFERENCE

ON

LOW-INCOME SHELTER

AND

HOUSING FINANCE

OCTOBER 11 - 14, 1982

SPONSORED BY :

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

AND THE

GOVERNMENT OF SRI LANKA

HOTEL LANKA OBEROI

COLOMBO, SRI LANKA

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WELCOMING REMARKS

MR. R. PASKARALINGHAM
SECRETARY

MINISTRY OF LOCAL GOVERNMENT, HOUSING AND CONSTRUCTION
GOVERNMENT OF SRI LANKA

Honorable Prime Minister, his Excellency the American Ambassador, Distinguished Invitees, Ladies and Gentlemen.

It is my great pleasure to welcome you to Sri Lanka and to the Third Asian Conference on Low-Income Shelter and Finance. I would like to express my sincere appreciation to the United States Agency for International Development for having selected Sri Lanka as the venue for this Conference this year. I also wish to express my grateful thanks to the Honorable R. Premadasa, Prime Minister of Sri Lanka for having spared the time in the midst of his very onerous duties to be present here to inaugurate this Conference.

The Asian Conference on Housing, due to the initiatives of USAID, has now become an annual event in the region and is at present the main forum through which we can share the accumulated experience of our friends and colleagues who are engaged in shelter activities in our neighboring countries. We are aware of the activities of USAID'S Office of Housing and Urban Development, which are directed towards making decent shelter possible for less privileged families of the Third World. This gathering, which brings together a distinguished group of housing and finance experts for a critical evaluation of housing and housing finance policies of the region, will contribute in no small measures to facilitate this process.

There has never been a time more important for us to get together, to hasten the provision of housing to the people of our countries. The population, most of whom are poor, in the countries of our region continues to grow, even while most people suffer from lack of decent shelter and basic services.

Although the need to arrest this problem is recognised throughout the world, the scale and intensity of the problem and the enormous cost of dealing adequately with it, have been major concerns and even sources of frustration for our governments.

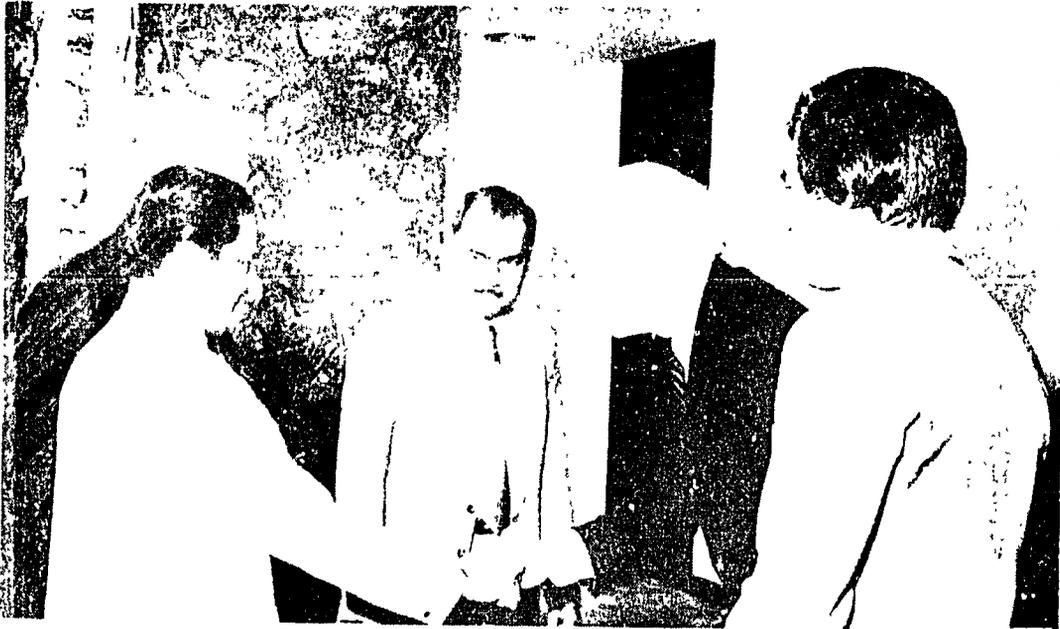
It is in this context and with this background that we are meeting today. We are aware, that most of the world's shelter is built by families for their own use, using their own resources. Our efforts in the future, in my opinion, should be directed towards enabling this process, through constructive measures. Presently in our societies, individual and community housing efforts are to a great extent facilitated by personal savings and other forms of inherited wealth. Sadly, the low income households, who are worst affected by the housing problem today, do not have sufficient access to such resources. Although the importance of institutional finances for housing seems to have gained in the recent years, Sri Lanka being a case in point, housing finance as a means of improving housing for the vast mass of the people, still remains at a rudimentary stage of development.

Our primary concern, in our deliberations during the next few days I understand, will be to examine this problem. We are fortunate to have in our midst distinguished persons, with deep understanding and long years of experience in housing and finance. The operation of housing finance systems throughout the world is impaired by lack of information on how they operate, how they resolve their problems and generally what their experience has been. This lack of information is a deterrent to the establishment of new systems and the greater development of existing housing finance systems.

All of you who are participating in this Conference are persons who have had very wide experience in your respective countries in the field of shelter. We admit, we are not facing an easy task, and we do not claim that we have a ready made package solution to offer. But, I am sure that we have much to learn from each other.

I am also confident that your discussions over the next few days will help to sharpen your own insights into some of the major concepts and approaches and help develop much needed institutions, techniques, and procedures through which we can assist the less privileged households in our countries realize their dreams of decent shelter and housing finance. It is with this hope that I wish this Conference every success.

THANK YOU.



1. Conference Opening Ceremonies; USAID's Director, Office of Housing and Urban programs Peter M. Kimm, greets the Hon. R. Premadasa, Prime Minister of Sri Lanka in the presence of the Hon. John H. Reed, Ambassador for the United States of America in Sri Lanka and Secretary of the Ministry of Local Government, Housing and Construction, R. Paskaralingam



2. The Hon. Prime Minister R. Premadasa of Sri Lanka lights the traditional oil lamp to open the conference.

WELCOMING REMARKS

MR. PETER M. KIMM
DIRECTOR, OFFICE OF HOUSING AND URBAN DEVELOPMENT
U. S. AGENCY FOR INTERNATIONAL DEVELOPMENT

It is my pleasure to join with the Government of Sri Lanka in welcoming you to this beautiful country. This is the third conference on shelter that the U.S. Agency for International Development has sponsored in Asia.

Since our last gathering in Bangkok in 1981, there has been a continuing worldwide recession, with serious consequences for all nations. Accordingly, programs to meet the world's growing low income shelter needs have had to adapt to new realities. I know we will have much to share with one another in the days to come. This is a unique opportunity to benefit from each other's experiences, our trials and errors, successes as well as failures, during this difficult period of transition.

Some of the basic problems of recent years including inflation, increasing costs and high interest rates are stubbornly still with us. Likewise urbanization and the massive need for shelter and basic services is also still very much with us. Over the next 50 years the world's need for urban housing and services will double, and the majority of urban dwellers in the developing world can accurately be described as poor. Their basic needs must be addressed if we hope to harness the benefits associated with urban growth, and indeed, if there is to be any chance to live in peace.

As the world has learned from the experience in Asia, there is a direct correlation between urbanization and successful national economic development. Cities are places of high productivity. Preserving this essential productivity depends on coherent policies and efficient investment in urban services. It entails using limited public resources in the most efficient possible way. In particular, such resources must serve as a catalyst for socially productive uses of individual resources.

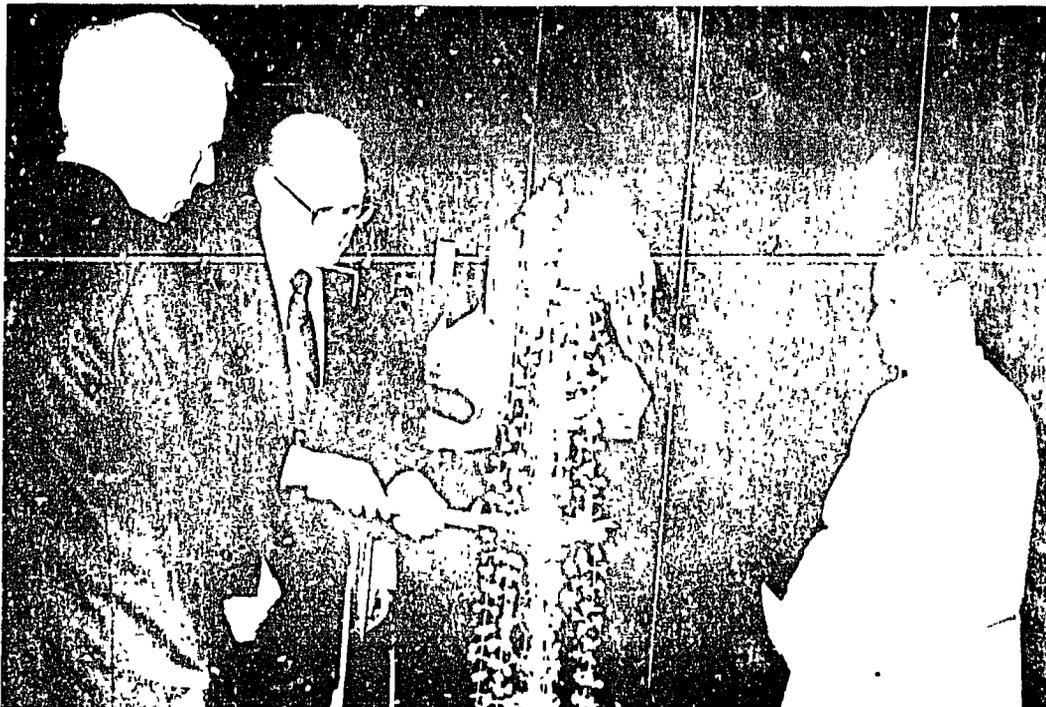
We all know that the sum of the combined energies of private individuals is essential for the amelioration of the shelter problems which now confront us.

A very large number of housing units must be created in a very short period of time and there is no magic with which this can be done. It must be done utilizing the resources of which we are now aware. This is only feasible if modest, affordable shelter solutions are pursued and if the existing housing stock, a precious resource regardless of how humble, is upgraded and improved. Governments should set as their highest priority the provision of basic services, including land and water, which individuals cannot provide for themselves. Given an opportunity, people will house themselves. It is our work to assist in providing them with such opportunity.

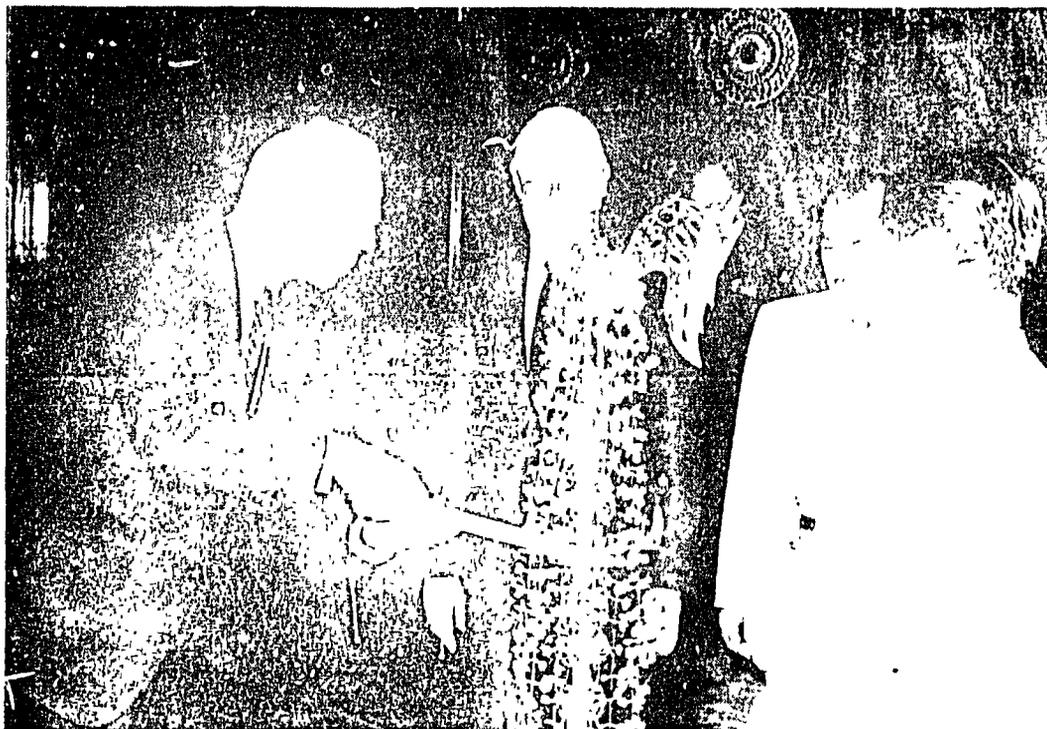
Despite the enormous problems still to be faced, I share with my colleagues the optimism that we will solve them. The shelter problem is solvable and is indeed beginning to be solved. We all know the road ahead will not be a smooth one, but at least there is a growing worldwide consensus on the appropriate approach to the problem.

In the three days ahead of us we will be discussing various aspects of how all this can be done. We will deal with the issues of how we can more effectively tap the resources of the private sector, how we can approach the growing need for training personnel; and, how we might better utilize modern computer technology to efficiently and effectively make decisions regarding the use of given parcels of land.

My country is fortunate to be represented in Sri Lanka by an Ambassador who is knowledgeable both about housing issues and the developing world. This stems from his experience as Governor of the State of Maine and his prior experience as Ambassador. It is my pleasure to present to you the United States Ambassador to Sri Lanka, the Honorable John H. Reed.



3. The Hon. John H. Reed, Ambassador for the United States of America in Sri Lanka lights the traditional oil lamp.



4. Mr. Peter M. Klun, Director, Office of Housing and Urban Programs, lights the traditional oil lamp.

WELCOMING REMARKS

U.S. AMBASSADOR JOHN H. REED
ON THE OCCASION OF THE OPENING CEREMONY
THIRD CONFERENCE ON SHELTER IN ASIA
HOTEL LANKA OBEROI
OCTOBER 12, 1982

Mr. Prime Minister, Honored Delegates, Ladies and Gentlemen. It is a pleasure for me to be able to welcome you to this Third Conference on Shelter and Finance in Asia.

The issues you will address are among the most difficult our societies must face. Needless to say, there are no easy solutions. I have the deepest respect for the talented men and women, like yourselves, who are committed to solving these problems. Although I am not an expert on housing, my experience in the construction industry and my relationship with the Sri Lanka Housing Program and my observations of the problems that must be faced daily by the rapidly burgeoning population of all cities, make it clear that we need to provide better systems that make adequate shelter available as quickly and as efficiently as possible. This is clearly a task which must avoid polemics and instead develop and execute meaningful action plans to arrest the crisis.

The severity of the shelter problem is known to all of you. Most available data suggest that by the end of the century the majority of the world's population will be city dwellers. That means that between now and the year 2000 our cities will have to absorb about one billion people - one billion people. And, as we all know too well, the developing world's greatest urban concentrations are in the Asia region - we are familiar with a much used comparison; the current urban population of India exceeds the combined urban population of Argentina, Brazil and Mexico - the three largest countries in Latin America.

It would appear to me that two questions should dominate an agenda to deal with the shelter sector issues.

The first question is how to get a sufficient money supply into housing to accommodate appropriate and affordable housing - especially affordable low-income housing ? Over the last few years, world economic conditions have intensified our problems in securing adequate funds. The volatility of the world's financial market places has been truly remarkable - the reality, however, is that our shelter problems aren't going to wait until better times.

I am happy to note that one of the Conference's co-sponsors, AID's Office of Housing and Urban Development, has shared its experience in worldwide workshops like this one. It was out of such meetings in the early 1960's that concepts like indexing and variable rate mortgages were developed - concepts which helped all of the world's nations to adjust to the recent volatile market place. I am equally happy to note that the Government of Sri Lanka just last July entered the market place using the Housing Guarantee instrument to secure the first phase of a planned \$100 million loan.

The second question is an easier one - how to keep open the exchanges of information critical to our mutual development? Your attendance here and at gatherings such as this becomes, it seems to me, the wedge to keep the information doors open.

I recommend that you be active participants - leaving no question unasked - your task demands that. Take advantage of the talent assembled in this room - for as I look at the roster of those present, it reads like a "Who's Who" in the housing sector.

We are indeed fortunate to have with us a man who has for two decades been recognized as a true pioneer in shelter provision innovations. Last year, President Reagan received Peter Kimm at the White House and gave him our Government's highest award for civil servants, noting how much the developing and the developed nations have benefitted from his service. Peter, on behalf of the fraternity here assembled, let me add my congratulations.

My appreciation of the magnitude of the shelter problem has been brought into clearer focus by the distinguished gentleman on my right. I have travelled around this island and viewed major projects which he has organized. I have seen first hand his Village Reawakening Program which we have been pleased to assist through our AID program. He has set for himself the goal of providing 100,000 housing units for the Sri Lankan people. In taking on the portfolio of Minister for Local Government, Housing and Construction, he has provided inspired leadership in solving the many problems of shelter delivery. He has also been the driving force behind the establishment of the United Nations International Year of Shelter for the Homeless.

It is with great pleasure that I present to you the Prime Minister of the Democratic Socialist Government of Sri Lanka, the Honorable R. Premadasa.

WELCOMING REMARKS

THE HONORABLE R. PREMADASA M P
PRIME MINISTER OF SRI LANKA

It is a pleasure and a privilege, for me to be present here this morning on the occasion of the inauguration of the Third Asian Conference on Housing and Finance. Your presence here today, reflects the interest that Senior Professionals and Decision Makers like you have shown in the housing problems of the poor in the countries of the Third World.

At the outset, let me extend a very warm welcome to the distinguished participants to this Regional Conference, sponsored by the United States Agency for International Development and our Ministry of Local Government, Housing and Construction. I wish all of you foreign participants a very pleasant stay in Sri Lanka. I gather from the Agenda that the Program that has been drawn for you for the next three days is indeed a busy one. It is however my sincere wish that you would also find time during your stay here to enjoy the beauty of our country and see something of the work of our people.

I owe a special word of thanks to USAID, for having selected Sri Lanka as the venue for this all important Conference this year. I also thank them for the excellent arrangements they have made today for this occasion. USAID's committment to assist countries to develop programs which will be effective in reaching the poor, is well know. This Conference could be seen as another step taken by the Office of Housing and Urban Development of USAID, to facilitate low-income housing in the Third World.

As far as Sri Lanka is concerned, this Conference is significant in several respects. You are meeting at a time when the United Nations has accepted that 1987 be designated as 'THE INTERNATIONAL YEAR OF SHELTER FOR THE HOMELESS'. This resolution was passed by the United Nations on the initiatives made by Sri Lanka. It will in my opinion be a watershed in the development of realistic housing policies in the world.

At present, strategies for the forthcoming International Year are being formulated. The conclusions of this gathering, which will examine the problems of shelter of the poorest among the poor, will undoubtedly go a long way in influencing the choice of alternatives for the International Year.

We are also fortunate in being able to participate actively in this Conference at this particular time. The Government of Sri Lanka, has had five years of intensive activity in the field of housing. It is presently reviewing its own programs and policies with a view to improving their benefits to the people. The deliberations of this gathering will be dedicated to seek alternatives and develop programs which will reach the poor. I therefore believe that your conclusions will go a long way in influencing the future housing policies and programs in this country.

The need to find cost effective solutions to the problems of housing is critical. Indeed, in no time in our history has the need for remedial action been so urgent and insistent. The magnitude of the world housing problem is well known. Shortage of housing resulting from the rapid growth of population and expansion of cities has been aggravated by the high incidence of poverty. Attempts made by successive Governments in the countries of the Region have failed to accomplish the desired results, or even to arrest these trends. On the contrary, the realities of increased energy costs, rampant inflation and the high rates of interest have complicated the task before us further. The indications are that these trends will continue unabated in the future. This presents an unprecedented challenge to the Politicians and the Decision Makers of the Third World today. We have to face up to the challenge of providing an effective solution to the shelter problems of the poor.

The challenge that we face today is that of creating a whole new approach to the problem of shelter. Based on our experience in the past, we cannot pretend to offer magic solutions to this complex and pressing problem. The only way open to us, appears to be to work together and benefit from each other's experience.

During the next three days of the Conference, you will discuss, review and compare the programs of your countries and more important, to avoid the mistakes committed by others. The path open to all of us, lies in this direction. However, the problems of housing could not be overcome by measures based on mere economic and technical reasoning. The social acceptability and political desirability of your recommendations will be equally important. Your deliberations should, therefore, take into consideration the political constraints in our own countries in implementing ideal policies.

In any program of housing, the role of the Government is of utmost importance. The Government must create and ensure a buoyant and vibrant economy that can provide sufficient funds for housing. At the same time, it has also to evolve an effective means of harnessing private financial resources. It must ensure the private sector's active participation and cooperation with the Government to overcome the massive problems of housing that face us.

Although compared with some other countries, Sri Lanka's housing problem may not look particularly acute, the problem is there nonetheless, and it is growing. To say that everyone - or nearly everyone - has some form of shelter is not at all to say that the shelter is adequate. There is overcrowding. There is poor or inadequate construction. There is a low-level of infrastructure, and there is sometimes lack of secure tenure.

Since 1978, the Government has tried to respond forcefully to the need for housing through a variety of programs. Housing is generally regarded as peripheral to the dynamics of the development process. It is therefore often ignored in the economic planning exercise, but we brought it to the forefront during this period. Housing was identified as one of the three "lead projects" of the Medium Term Investment Plan. The Government assigned high priority to this activity and declared its resolution to build 100,000 houses during the plan period. As a result, the transfer of resources to the sub-sector recorded a massive increase and the intensity of activity has increased several-fold.

Progress with the programs that are undertaken has been very good so far, and the Government is well on its way towards fulfilling its original promise of 100,000 houses. In spite of this general success, however, the Government has been faced with a variety of problems at several different levels. The country's economic performance, although quite impressive in relation to its past performance, has been inevitably affected by the worsening world economic situation. This has affected all countries at the present time. These negative economic trends include deteriorating terms of trade, high inflation and fluctuating high rates of interest. Land prices have increased and construction costs have rapidly escalated. Ironically, these last increases are due in part to the rapid economic growth the country has been experiencing.

All of this encouraged the Government to revitalize its housing policy. The high priority placed on housing remains. We continue our commitment to our original goals. We have a commendable record in the field of implementation of our housing programs. But the financial stringency that we and other Governments, both developed and developing, face compels us to ensure that we spend our monies as effectively as possible. What is spent must be spent more effectively. In other words, it is a matter of providing more and better housing out of the resources available.

The performance of the private sector, which is assumed to carry the major share of the housing burden, has been improved. Private sector housing, while falling short of goals, still tends to go, on the whole, to those who can afford the high costs. The burden of providing shelter for the less well-off, has fallen squarely on the Government.

What can be done to improve the performance of both the private and public sectors in housing for the coming years? It is important to realize that public and private efforts in this area are complementary. It is also important to realize that these problems faced by both sectors are to a great extent common.

These problems include rising costs, high interest rates, and the lack of finance and credit. Although these problems affect each sector somewhat differently, they operate in both. At the central government level, for example, housing must compete with other national priorities for its share of funds. Housing is sometimes at a disadvantage here because it is not seen as a "productive" national investment. However, in reality, there are a large number of direct and indirect productive social and economic benefits from improved housing. We believe that housing is not only beneficial for shelter, but also for employment, production and the reawakening of man.

For the private sector, money is also a major factor. Housing investment competes with other types of investments in the private capital market. At the present time, investment in housing, which typically demands long term, low-interest loans, simply cannot compete with the shorter-term, high-interest returns from other types of investment.

What can be done then? As was said earlier, there are no simple or easy answers; no strategies to be picked up and put into practice. The housing problem is essentially more and more a problem of housing finance. In other words of money - where it comes from, how much it costs, and how effective it is. Any solution to Sri Lanka's housing needs, and any efficient working partnership with the private sector, is going to have to address the question of housing finance first of all.

The Government of Sri Lanka is acutely aware of the importance of housing finance. Steps have been taken to create a Housing Bank which can respond, specifically to the special needs of people seeking housing finance. It is hoped that this initiative will encourage the private finance institutions to make more money available for housing as well. The Government will strongly support private sector initiatives in this field.

We recognize that the housing needs of all levels of society are important though it may seem that we are more concerned with the shelter problems of the poor. We know that the private sector has a wealth of experience, skills and drive which makes it a better provider of housing in some areas than the Government. There is an urgent need to examine closely the possibilities for a more effective partnership between the two sectors, which takes account of the different perspective each brings to the field of housing.

It is obvious that each shares a great deal with the other. The Government is committed to continuing its dialogue with the private sector with a view to finding ways in which each can help the other, with the ultimate aim of improving housing for all Sri Lankans.

The theme of the Conference, "PUBLIC-PRIVATE PARTNERSHIP FOR LOW-INCOME SHELTER," should prove extremely useful to policy makers in the development of this dialogue, and in the formulation of concrete ideas which will make this hoped-for partnership a reality. I thank once again the USAID, without whose willingness and active cooperation this Conference would not have been a reality. I thank the officials of the collaborating agencies for their untiring efforts in organizing this Conference, and I extend to the participants my sincere wishes for a fruitful Conference and an enjoyable stay in Sri Lanka.

I now take great pleasure in inaugurating this Conference.

THANK YOU.

PUBLIC AND PRIVATE PARTNERSHIP IN HOUSING & FINANCE

PRESENTED BY: MR. CLAUDE J.J. BOVET
FORMER PRESIDENT
INTER-AMERICAN SAVINGS & LOAN UNION
U. S. A.

We have been addressing the issues of housing and shelter in terms of a pressing social need and major problem facing our various economies. But I would like to add another dimension to this subject.

A strong and healthy housing industry is also one of the more potent and wide-ranging activators of a national economy. It has beneficial ramifications far beyond the mere provision of homes for given sectors of the population. It is an important contributor to entrepreneurial and economic growth and, properly encouraged, has the very definite potential of being a country's single largest:

- * employer of labour (especially of the unskilled kind),
- * user of domestic building materials, and
- * catalyst for expanded thrift and capital formation efforts.

So, if the housing industry is such a good thing, how come it does not develop automatically ? Why is it that the private sector is failing to respond to the challenges and opportunities available without further ado ? Or, at the very least, why is it so difficult for governments to organize the industry's growth and immediate success ?

Part of the answer lies in the industry's very fragmentary nature. The fact that it is composed of innumerable different activities and a myriad of different participants. This, which is one of the industry's strengths in the long run, can be its undoing at the beginning.

And another part of the answer lies in that sordid subject: "Money" -- or, rather, the lack of it because of the natural difficulty of raising adequate financing for relatively long-term low-yielding investments. Thus, a strong and vital housing industry is not one that occurs automatically given its needs and opportunities, nor is it one easily attainable within the development of market forces alone. It requires decisive stimulation and usually profound intervention by the public sector as well as strong support from the private sector before it can hope to reach maturity.

And this is why the theme of this Conference is so apposite. It will take very close public and private sector partnerships and collaboration to make a growing housing industry viable. It is probably fair to assume that not even the wealthiest countries or governments have the capacity to fully solve their nation's housing needs by themselves. And that neither does the private sector alone offer the ability to meet a country's housing requirements, particularly when addressing the needs of population sectors too weak financially to be fully exposed to open market forces.

And here we should distinguish between the government's role in setting the course of a country's economic and institutional development and its sometimes additional role as an active participant and competitor in the country's economic processes.

Decisive intervention by governments is usually required to create the housing industry's infrastructure, to expand its benefits to weaker sectors of the economy, and to provide the incentives for entry into this field by forces which would otherwise lie latent. This is done by the judicious setting of national housing and finance policies; by appropriate legislation and regulation; and by the establishment of incentives (or disincentives as the case may be) to better guide the economic activities of the private sector. And a wise government would, at this stage, probably avoid the temptation of becoming, directly or through governmental agencies, a direct participant in the process.

But choosing a course of action and setting the national priorities is not always a clearly defined issue. Careful evaluation must be made of the relative, separate or complementary, merits attainable within the particular framework of individual countries by their respective public and private sectors.

At this point, if I had to speculate as to why I am today honoured with the privilege of addressing such a sophisticated audience as you, I would guess that is was not because of any additional wisdom on my part but quite simply because (as Mr. Kimm pointed out in his generous introduction). I have lived on both sides of the fence. I have seen the housing and finance problems from the vantage points of both the public and the private sectors. And I have been additionally fortunate to see these through the optics of both developing and developed nations.

Thus, rather than attempting to lecture you on ideal (and possibly unreal) conditions for the relative participation of the public and private sectors in different countries, let me explore with you, in this presentation and in the plenary sessions and round-tables to follow, the various aspects of national housing and finance policies which can be relevant and constructive under varying circumstances and national conditions.

What we should seek to identify are those policies which, allowing for the different doctrinary and operating practices extant in the public and private sectors, can combine these into a harmonious whole better prepared to face and resolve the enormous challenges posed in the housing area.

To this end, we should carefully evaluate in each case what the private sector is and is not already capable, or prepared, to do without governmental prodding or stimulation and what more it could additionally do with further specific governmental assistance.

And, in this regard, when referring to the private sector, we should separately consider:

- * the housing construction and building materials industries,
- * financial intermediary institutions and the savings public,
- * the home users themselves.

And when referring to the public sector, we should probably equally distinguish between national governments, multi-national bodies and foreign aid agencies. Also, when dealing with specific measures of governmental assistance one should be prepared to clearly identify and mark any elements of subsidy involved in this assistance, so that the subsidy does not become a permanently distorting factor in the market but, on the contrary, can always be held up to public scrutiny for the continuous effectiveness of its desired goals. And this should apply regardless of whether the subsidy is self-evident or whether it is hidden deep in some other area of the national economy.

And, finally, let us now review the problem as it originates within the various component parts of a national housing program.

A first areas of analysis in the formulation of any housing program is the availability of land and the urban infrastructure necessary to accommodate present and future needs.

Do these elements exist and are they readily available to the private sector or must they necessarily be provided by the public sector ... or to what degrees in between these two extremes ?

Possible areas for consideration in this regard are :

- (a) The use of taxation to discourage hoarding in private (and public) hands, by making it increasingly expensive to maintain unused lands in an urban context.
- (b) The granting of tax incentives to encourage the development of suitable construction sites and the provision of the required urban infrastructure and community facilities.
- (c) The use of zoning laws and restrictions to force desired land use results.
- (d) The acquisition and conservation of lands for future expansion purposes.
- (e) The promotion of formal or informal joint ventures between public and private sector entities or groups designed to enhance their respective contributions (e.g. aided self-help programs).
- (f) The direct promotion and development of urban lots by the public sector when not in competition with the private sector or where given experimental or demonstration effects are desired.

A second area of analysis relates to the actual house construction process itself.

Here again it would probably be wise (on any but political considerations which are sometimes paramount) for the public sector to refrain from direct participation and to direct its efforts instead to those areas where the private sector might need additional guidance or stimulation.

Typical of these would be :

- (a) The search for new materials and construction methods and design.
- (b) The rationalisation of massive construction projects beyond the current experience of the private sector.
- (c) Assuring on-going and in-depth markets for the building materials, industries and the construction trades.
- (d) Avoidance of bureaucratic restraints, supply short-falls and other time delaying and cost increasing factors.
- (e) Assistance in promoting and marketing non-traditional housing solutions.

A third area of analysis concerns the availability and cost effectiveness of the labour component in all land development and housing areas.

Here the public sector can play a very important role by assuring that :

- (a) Its labour policies are not unduly protective or supportive of expensive or inefficient practices.
- (b) Ample opportunities are offered for entry into the labour markets and for training in the necessary skills.
- (c) Mobility from job to job, within jobs, from one industry to another, and between locations is duly facilitated.
- (d) Aided self-help and similar schemes are offered all the support and assistance they warrant.

And a final, more intractable and critical area of analysis concerns the all pervasive need for financing to cover not only the preceding phases of land acquisition, land and community development and house construction, but also very importantly the home purchase price itself.

And with this problem of financing we have reached the ultimate exclusive domain of the private sector, where everything hinges around the needs of individual savers and individual borrowers.

Here government policies should be designed to ensure the freest, safest, most efficient and adequate flow of funds from the saving to the borrowing public, and one which has the greatest chances of ever increasing expansion. Not a simple matter.

Mr. Deepak Parekh, Deputy General Manager of the Housing Development Finance Corporation of India will be expanding on this theme in his presentation to you after lunch today.

On my part, given the complexities of this subject and the plethora of solutions that have been tried in the past and the new ones that are now evolving, I would prefer to reserve a detailed discussion thereof until after Mr. Parekh's presentation, when we will be better prepared to review together its various possibilities and implications.

In particular, we shall be analysing the primary and secondary savings and capital markets; the role of financial intermediary institutions, both private and public the diverse savings and mortgage instruments; possible defences against inflationary pressures and any other subject in this field that you may care to bring up. Also we should be prepared to review the current condition of the international capital markets and the long range trends that may be setting therein.

But, over and over again, we should continue to focus on the savings and cost reductions possible in every area of the housing field and on the contributions available from the so-called informal sectors, as these, to the extent that they release otherwise limited resources, are also a form of financing.

In recapitulation, the main points of my presentation so far have been :

- * that the principal emphasis of a country's solution to its housing and housing finance needs should be left to its private sector.
- * that the government's actions should be directed to enhancing the private sectors ability to discharge this role.
- * that only in those areas where it is absolutely impossible for the private sector to participate effectively should the government attempt to act directly as an entrepreneur; and
- * that any and all elements of public subsidy should be permanently highlighted and evaluated for their continuing efficiency.

By now you have surely seen through my personal bias in favour of private sectors solutions within a framework of public sector stimulation and support. however, as previously stated, my purpose has not been to recommend one solution or another, but rather to stimulate our collective thinking and future round-table debates in directions where we can all benefit from our diverse back-ground and experience.

I am sure that the foregoing list of topics only begins to scratch the surface of our respective housing problems and their possible solutions, and that all of you in this Conference will be able to provide additional ideas and examples to further enrich our analysis of the subject.

THANK YOU

THE OFFICE OF HOUSING AND URBAN DEVELOPMENT
U S AGENCY FOR INTERNATIONAL DEVELOPMENT

AND

THE MINISTRY OF LOCAL GOVERNMENT,
HOUSING AND CONSTRUCTION
DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

THIRD ASIAN CONFERENCE ON LOW INCOME
SHELTER AND HOUSING FINANCE

COLOMBO, SRI LANKA, OCTOBER 11 - 14, 1982

MOBILIZING PRIVATE CAPITAL FOR HOUSING FINANCE

A PAPER PRESENTED BY

MR. DEEPAK PAREKH,
DEPUTY GENERAL MANAGER
HOUSING DEVELOPMENT FINANCE CORPORATION LTD. OF INDIA

This paper was prepared by Nasser Munjee,
Economist, HDFC and does not necessarily
reflect the views of the Board of Directors

MOBILIZING PRIVATE CAPITAL FOR HOUSING FINANCE

PRESENTED BY: MR. DEEPAK PAREKH,
DEPUTY GENERAL MANAGER,
HOUSING DEVELOPMENT FINANCE
CORPORATION OF INDIA

URBANIZATION: THE PROBLEM OF HOUSING

The 1970's, apart from being the decade of world inflation, also witnessed a significant transformation of human settlement patterns. In the developed world, urban growth showed a tendency to dwindle while in the developing world urban growth continued to rise sharply. In 1950 only one city (greater Buenos Aires) had a population of over 4 million people, by 1975 there were 17 such cities in developing countries and by 1980, 22 cities. By the end of the century there may be 60 cities with a population to exceed 4 million and 18 cities with a population of 10 million.

Urban growth in developing countries takes place in an environment where migration largely involves people with low income; people do not have sufficient resources to set up a home of their own. Urban growth, thus, outstrips the ability of cities to provide accommodation and services resulting in overcrowded squatter settlements, slums and pavement dwellers within and on the perimeters of almost any large city.

In India, the 1981 census indicates that the urban population is 150 million, the fourth largest in the world, behind China, the USSR and the USA and it is growing at a rate of almost 3.9% per year. The magnitude of the housing problem is so large that it has become very difficult for successive governments at the State and Central level to ignore. The 1970's saw, for the first time, the setting up of central and local institutions which would examine housing and urban problems of the country.

In 1970 the Housing and Urban Development Corporation was established at the central level; a good example of a local institution is the City and Industrial Development Corporation set up in 1972. Later in 1978 the Housing Development Finance Corporation Limited came into being as an all India housing finance company.

In other words, as the problems of urban migration intensified they rapidly translated themselves into physical embodiments of human poverty in urban areas; a problem that could hardly be left to the market forces to solve. The response was the establishment of various institutions to help tackle the problem.

The main policy option that the Government has pursued is one of improving housing conditions by directly building and allocating housing units to specified target groups. Construction and organization has generally been undertaken at the local level through para-statal organizations and financial either by State Governments or by HUDCO in recent years. The Life Insurance Corporation has also undertaken the finance of housing by supporting the cooperative housing societies and HUDCO. These efforts have helped considerable numbers of people classified as economically weaker sections i.e. those earning less than Rs. 300.00 per month (US\$. 30). HUDCO, through its finance schemes has helped to house over five million people involving finance of Rs. 700.00 crores (US\$. 700 million).

EXISTING HOUSING FINANCE STRUCTURE

While this has been a welcome beginning, the Government has not as yet turned its attention to increase both public and private investment in housing by developing a housing finance sector in the Indian economy. Builders of homes (builders) and commercial contractors require finance for their activities' similarly home buyers require long term loan support for the purchase of a dwelling unit.

In the absence of a formal method by which both groups of people can raise resources, the housing market becomes seriously skewed towards the construction and delivery of housing units to those who are in a position to make immediate payments.

This is precisely the outcome of events in India: builders accept advance payments from potential future owners even before they commence construction. As construction progresses, owners are required to make progress payments with the final installment on possession of the unit. As the financial needs of neither builders nor home buyers are met through a housing finance system, the government itself loses a handle by which to control the housing market.

In most countries where a housing finance system exists, the mortgage rate is a key financial instrument which the housing market is influenced and it responds closely to overall monetary conditions in the economy.

In India, while nearly 85% of total housing investment is in the private sector, with only 15% or roughly Rs. 1302 crores (US\$. 1.3 billion) over the sixth five year plan (1980-85) allocated to public sector housing, the government has almost no control or influence on private sector investment apart from legal controls on housing development. Further, public sector funds which are normally scarce are allocated for housing by government after other 'priority' needs are considered such as food price supports, health and welfare programs, family planning, industrialization and agricultural development and so forth. Only as generally incomes rise will a gradual increase in housing investment be noticed but in the meantime considerable effort is required to channel existing private sector monetary flows in a manner which optimise and multiply resources from ultimate lenders to ultimate borrowers through appropriate capital market instruments and institutions.

1 One crore is equivalent to ten million.

Problems Posed by Existing Structure:

One of the key financial variables in the housing market is the rate of interest for housing finance. In the absence of an official housing finance system this rate is determined by the informal availability of such finance. If builders rely on unofficial sources of funds they are obliged to pay high short term market rates. The cost of finance is either passed on to ultimate purchasers or their borrowing requirements are minimized by accepting advance interest free payments from future owners. The pace and type of building activity is thus set by the ability and willingness of people to pay for housing. In market economies, as the cost of finance escalates, house building programs diminish, thus causing unemployment and other macro-economic effects as has been witnessed in the USA so dramatically over the last year.

While builders require access to short term borrowing, home buyers require long term financial commitments from housing finance institutions. The availability of such finance depends largely on the existence of institutions undertaking this type of activity and on personal incomes and repayment capacities. In a country with low incomes it is likely that conventional housing finance institutions will cater to those well above the median income level of the region or country. Nevertheless, these institutions are crucial if a housing finance system is to be established which can gradually expand to meet the requirements of lower income people.

In both the above cases, finance for home builders and home buyers can only be ensured if there is a formal recognition of the legitimate needs of each and the provision of these needs at market rates of interest through the capital market are the investment portfolios of financial institutions. Even though market rates would reflect prevailing conditions in the capital market, an attempt to lower the cost of finance by controlling interest rates would simply result in a decline of the flow of resources in that activity from ultimate lenders.

Financial subsidies are best applied directly at the source at which the benefits are to be received; the ultimate buyer. Where the Government itself is a primary builder, very often the cost of finance is absorbed by them in order to minimize costs to targeted beneficiaries. This type of subsidy benefits ultimate buyers who are often from high income groups; in other words blanket subsidies are a wasteful form through which to help targeted beneficiaries.

At present, neither home builders nor home buyers have access to a formal market for housing finance. Home builders, being large organized concerns, are in a position to raise funds albeit at a higher cost, whereas individual home buyers are in a somewhat more disadvantageous position. They are forced to liquidate whatever assets they may own, draw on their disposable incomes, current savings, borrow from relatives and so on. The absence of access to the long term funds limits their capacity to invest in housing of their own.

Both the cost and availability of housing finance is perhaps the most pressing constraint on the progress of housing development. Both the suppliers and buyers of housing units must have access to financial resources so that the flow of scarce capital is optimized within the housing market, fresh capital raised through savings schemes, bond issues and other instruments, and the housing industry placed on a solid foundation.

Housing Finance: the requirements

One of the main conclusions of the previous section was the need to meet the financial requirements of both home builders and home buyers. A housing finance system would need to take care of both sides of the coin: the suppliers of housing units and their buyers. In the absence of this, builders become accustomed to high costs of borrowing and thus pass these onto the capital costs of new buildings. High capital costs in turn mean that buyers have to raise more resources either of their own or through institutional support.

SUMMARY OF MAIN POINTS COVERED IN THE
THREE WORKSHOP SESSIONS

INTRODUCTORY

- A (i) The chair presented a short paper to all sessions and commented that though in this paper the private sector is assumed as the formal private sector, the informal "one-man skilled artisan" is by no means excluded.
- (ii) "Low-income groups" are taken to mean the lower 50% of households as per the standard USAID definition, but could include up to the 60th or 70th income percentiles for purposes of discussion. It is recognized that the lowest 20% represent a special problem to both Government and private sectors.
- (iii) Few Governments (including the USA) can meet the housing needs of the poor on their own, so that private participation is needed. While there are several things Governments can do to encourage private sector participation, they must begin by accepting that what motivates the private sector is profits, i.e., a reasonable return on capital and management.

PUBLIC AND PRIVATE SECTOR IN PARTICIPANT COUNTRIES

B (i) In Thailand, the National Housing Authority is now facing a major acquisition problem in Bangkok. Most land is now in the hands of the private sector who so far have only been interested in high profit margins and quick returns. However, the private sector must now be induced to produce for the lower-income groups. Land cannot be compulsorily acquired by the Thai Government, and Government is further hampered by the lack of a master-plan for land-use.

(ii) In Sri Lanka, land is not a problem as far as concerns the poorest groups, as Government already owns the land they live on. The process of land-acquisition is also not a problem. The high cost of land to the private sector is a major problem, as it is the high cost of building materials. The formal private sector in Sri Lanka has not yet participated in low-cost housing construction inspite of tax incentives given. The predominance of commercial capital over industrial capital had led to a search for quick profits, and the idea of "enlightened capitalism" has not yet taken root. There is now a need for Government-private sector dialog concerning the need to recycle profits made from the last 5 years constructions programs.

A major constraint in private sector participation in low-cost housing has been the lack of cheap construction finance. In addition, banks would need Government guarantees for loans made to the poor. It is generally thought that provision for the poorest sections would have to continue to be primarily a Government responsibility.

- (iii) In Pakistan, housing construction has been primarily in the hands of the private sector for the last ten years. Government acquires land, provides sites and services and sells the title to developers (in the case of multistory buildings) or to individuals. Response has been good and payments are made. In all site and service projects, cross-subsidies are used. However, the cost of developed land is beyond the capacities of the poorest sector and this problem has not yet been solved, even with the development of a National Housing Policy. The Government is now considering sacrificing provision of services as a way to increase affordability.
- (iv) In India, a certain degree of success has been achieved in certain states in developing cooperative housing and encouraging private promoters to construct, through a system of legal and fiscal incentives, Government guarantees and provision of subsidized capital together with appropriate controls. There have been some problems of developing sources of long-term finance, and most of the shelter constructed has gone to the 40th income percentile and up. Employer provisions to housing is encouraged by Governemnt in the plantation sector.
- (v) In Australia, most housing is in the hands of the private sector. Housing cooperatives are formed by individuals and professional administrators for the express purpose of purchasing homes and the cooperative lasts as long as loans are outstanding. Government guarantees certain loans.

- (vi) Nepal has neither an industrial or commercial base. It is 90% agrarian and 85% subsistence, with one of the lowest per capita incomes in the world. It therefore has a low tax-base and a minimal Government budget. However, as the urban sector in Nepal has grown from 10% to 20% in the last 5 years, Nepal needs to study the example of other Asian countries now.
- (vii) The success stories of the development of the private sector in Korea and Taiwan were noted, but a delegate from India remarked that this was mainly due to a massive infusion of external financing being available at the right time.

MAJOR STATEMENTS AND SUGGESTIONS

- C (i) The "informal" sector is an important part of the "private" sector in relation to the provision of low-cost housing.
- (ii) It was felt that the key areas of Government intervention should be:
- * access to land
 - * provision of infrastructure
 - * construction and mortgage financing
 - * market information
 - * training
 - * building materials research
- (iii) The assumption that "housing" as such should be provided (by government or private sector) for the very poor was questionable, since they cannot afford any new housing except shanties.
- (iv) Any government subsidies should go to beneficiaries rather than to private developers.
- (v) In encouraging the private sector to build low-cost housing, the Government should include the provision of employee housing by corporations.
- (vi) The beneficiaries themselves should be encouraged to form housing cooperatives and the government should support this by providing land low-interest loans and low-cost materials.

- (vii) In countries where private builders are weak, government should help strengthen them (especially small companies) so that they can increase their housing production; in countries with strong private builders, government should seek to redirect their capabilities to low-income housing.
- (viii) Substantially more involvement of the private sector in housing provision is desired and expected throughout Asia, but not to the extent of Korea or Taiwan, since conditions are quite different.
- (ix) National housing policies should include the private sector in providing low-income housing cooperatively with government.
- (x) The specific roles of the public and private sectors are best determined by the particular conditions in each country, so policies and programs should and will vary significantly.
- (xi) Where unnecessary restraints to construction exist, for example, unnecessarily high standards, these should be removed.

Christine E Nolan, Rapporteur
Robert S DeVoy, Co-Chairman
October 14, 1982

HOW GOVERNMENT CAN ENCOURAGE PRIVATE PRODUCTION
OF LOW-INCOME SHELTER

Presented at Third Asian Conference on Low-Income Shelter and Housing Finance, Colombo, Sri Lanka, October 11-14, 1982, by Narin Sakulcalanuwat, Chief of Policy and Planning, National Housing Authority of Thailand and Robert S. DeVoy, NHA Resident Advisor (USAID/Thailand).

There are three key steps in encouraging private production of acceptable low-income housing:

A. Government must gain an understanding for and appreciation of what really motivates the private sector housing developers and builders.

B. Government must devise and carry-out programs which will motivate the private sector to do what few are doing now -- and for sound economic reasons.

C. Once developers and builders are willing and ready to produce low-income shelter, Government should stand back and let them do it.

Let us consider each of these steps:

A. What motivates private developers ?

The ultimate motivation is profit, but that is not all there is. Developers need continuous action in order to sustain their operations. Delays are deadly. Also developers seek recognition, satisfaction and increasing opportunities, just like everyone else.

In addition to these positive motivations, developers are anxious to minimize their "downside" risks, i.e., financial disasters.

Private developers mostly are free spirit types who prefer to maintain control, thus they are reluctant to deal with governments unless it is either absolutely necessary (i.e., regulatory approvals) or exceedingly attractive (i.e., very profitable). The issue of how much profit is enough for the private sector or acceptable to Government depends on the conditions in each country. The key point is that a reasonable profit must be attainable to motivate effective private action.

Such profits can be realized by the following four ways:-

1. Higher sales prices per unit result in higher profits, given effective markets and cost controls. However, high prices are counter productive in providing housing affordable by the poor.
2. Larger markets can increase total profits while keeping unit cost affordable. Larger markets can be achieved by such actions as broadening the products for sale, focusing on the larger effective segments of the market, offering a more attractive shelter product, arranging financing for buyers, improving marketing and sales efforts, etc.
3. Faster sales of housing units also can increase profits by limiting overhead and interest costs. Faster sales can result from these same actions, but also crucial is to reduce the time required for project preparation and construction.
4. Lower costs per unit can be realized by strict control of the costs of land, building materials, labor, construction financing, marketing/sales, and management/overheads. Lower costs to the developers and house purchasers also can be achieved by shifting some costs to Government, eg., off-site infrastructure or land cost write-downs.

B. What can and should Government do to encourage the private sector ?

Government policy and practices should clearly indicate that such private investments are needed, wanted and encouraged. In too many countries, the low-income housing market is reserved for public housing agencies -- sometimes because of the belief that the private sector will not or cannot do the job, and sometimes because the public agencies simply want the market to themselves. In some countries private developers are weak and presently incapable of providing affordable housing for the poor without Government subsidy. But in many countries the private developers can and will produce if Government will just let them. Obviously, in the first case Government must foster the private development sector, while in the latter case it need only provide incentives for the existing developers and builders to redirect their efforts towards building low-cost housing. In both cases, the clear prospects for reasonable profits are essential.

Some of the actions which Governments readily can take are:

To help enlarge the markets and speed up house sales:

- 1 Contract with developers/builders to provide "turnkey housing".
- 2 Market the projects for the private developers, including pre-qualification of buyers or renters.
- 3 Provide hire-purchase or mortgage financing, and/or insurance on the most reasonable terms possible without Government subsidy.

- 4 Undertake regular housing market surveys and special studies to identify the specific nature and magnitude of housing need and demand in each major market area. Make the data and studies readily available to all interested parties so that developers can most effectively aim for the desired target groups.

To lower costs to the developers/builders and to the consumer, implement the above Government actions, as well as the following:

- 1 Make Government owned land available for low cost housing projects (private or joint venture).
- 2 Acquire private land and make available at cost or even with a write-down.
- 3 Provide lower-cost building materials by large volume production, purchase, storage, distribution (i.e., economies of scale).
- 4 Reduce land development and building regulatory standards to acceptable minimums for health and safety.
- 5 Streamline regulatory process to speed up project approvals.
- 6 Provide off-site and perhaps major on-site infrastructure where the benefits are spread beyond the project boundaries (costs to be recaptured by property taxation or special assessments).
- 7 Provide construction financing at Government cost of borrowing or guarantee developer's construction loans.

- 8 Engage in joint ventures with complementary contributions of land, construction financing, design, tendering, provision of infrastructure, construction management, marketing/sales, long-term financing, and estate management -- depending on respective resources and capabilities of the Government and Private sector partners.

Some of the above ways that Government can encourage the Private sector to provide shelter for low-income households are being demonstrated in some countries, others are not. All these ways can be useful, but they are of varying value depending upon the circumstances in each country.

C. What Government Should Not Do

1. Don't try to force developers to build houses with less than a reasonable profit -- they may do it once, but not repeatedly.
2. Don't change the "rules of the game" or interfere in the developer's activities.
3. Don't overload the private projects with unnecessary regulations, high standards or requirements for ancillary facilities and programs (eg., health clinic, job training).
4. Don't assume that Government officials know more than private developers about housing construction and marketing (each knows different things, not more or less).
5. Don't give up too easily or quickly. Getting the private sector into low-cost housing provision is a big task.

The underlying premises of this discussion are:

- (1) Government should encourage the private sector to provide low-income housing, and
- (2) there are prudent actions which Government can take.

We believe these premises are valid. Nevertheless, there are some basic issues to consider, such as:

1. What things can the public and private sectors do best individually and cooperatively ?
2. What and how much can Government properly do to encourage the private sector ?
3. Can these public initiatives really be effective on a sustained basis ?

It is clear that Government shelter projects alone are not adequate to house the growing urban poor. In most countries the private sector has demonstrated a substantial capability to deliver middle and upper income housing. The challenge is to expand, activate and redirect private developer and builder capabilities to provide low-cost housing on a prudent basis for all concerned. By so doing, Government can achieve a multiplier effect on its investments in low-income shelter.

A SUMMARY OF PROCEEDINGS
WORKSHOP B:
PRIVATE RESOURCE MOBILIZATION

DISCUSSION LEADERS: CLAUDE J.J. BOVET
 NASSAR MUNJEE

Discussion started off on banking and then mobilization of used materials or discarded materials; banking at low level income strata of society. The workshop expanded on the above and also the most important resource that of land was discussed.

Although the session concentrated mostly on the income group which has accessibility to funds, it releases the pressure of housing from the lower income groups or from the groups of the informal sector with tendency to be on the move.

In the context of making funds available to the low-middle income group it was suggested that industrial institutions should lend for prospective house builders or owners or should provide the houses themselves and sell at subsidised rates to employers.

At a low-income level recycling of discarded goods was implemented in Peru or the house builders could borrow needed building materials from a materials bank as and when they required the material and later on the need being satisfied would return them to the material bank. As transaction took place in kind it beat inflation and both parties were kept happy. The loan did not become a heavy burden for the borrower. There was security for the bank because if people did return the loans they could not borrow further. The material bank also had provision for renting building equipment.

Another case of resource mobilization was where the private sector agreed to the domicile collection of water for electrification and to finance the connection from main line to individual and got repaid through the monthly electricity bills.

Exchange of services is a very basic and very important part of resource mobilization. People who would otherwise be called unemployed provide services for neighbors who are formally employed.

The high rise in the price of prime land which hinders the middle income group from living near their work places was discussed. Two aspects of hoarding were pointed out - one in Peru where hoarders were taxed and had to build or sell and the other in Bombay where in 1976 government brought a land freeze and demanded owners to build only for the low-income. People let their land lie idle rather than build for someone else. Then speculators also make the most of situations like this and the planning of the town and its growth goes for a six.

In Sri Lanka the Land Reform Commission took the land from the gentry and brought a land ceiling of 50 acres. The land which is not fit for agriculture has been given and re-allocation to individuals from the low income groups or those with no land but with finance available. This was a very good method of mobilizing the resource of land.

Another very good experience from Sri Lanka is where local banks gave loans for a small scale building materials industry. Thereby the material for housing became available to the house builder locally. This system has somewhat become overshadowed by more sophisticated methods of banking - mostly due to constraints on local borrowers to borrow bigger amounts.

In India HDFC has had great success with housing including infrastructure which has been built for tea plantation workers and the Army where line of credit is extended to employers and through them channelled to employees for housing.

Instead of just new banks it was suggested that institutions solely for housing are the need of the day.

A SUMMARY OF PROCEEDINGS
WORKSHOP C:
TRAINING

DISCUSSION LEADERS

RICHARD BENDER
DISA WEERAPANA

A) TRAINING NEEDS - Who needs training

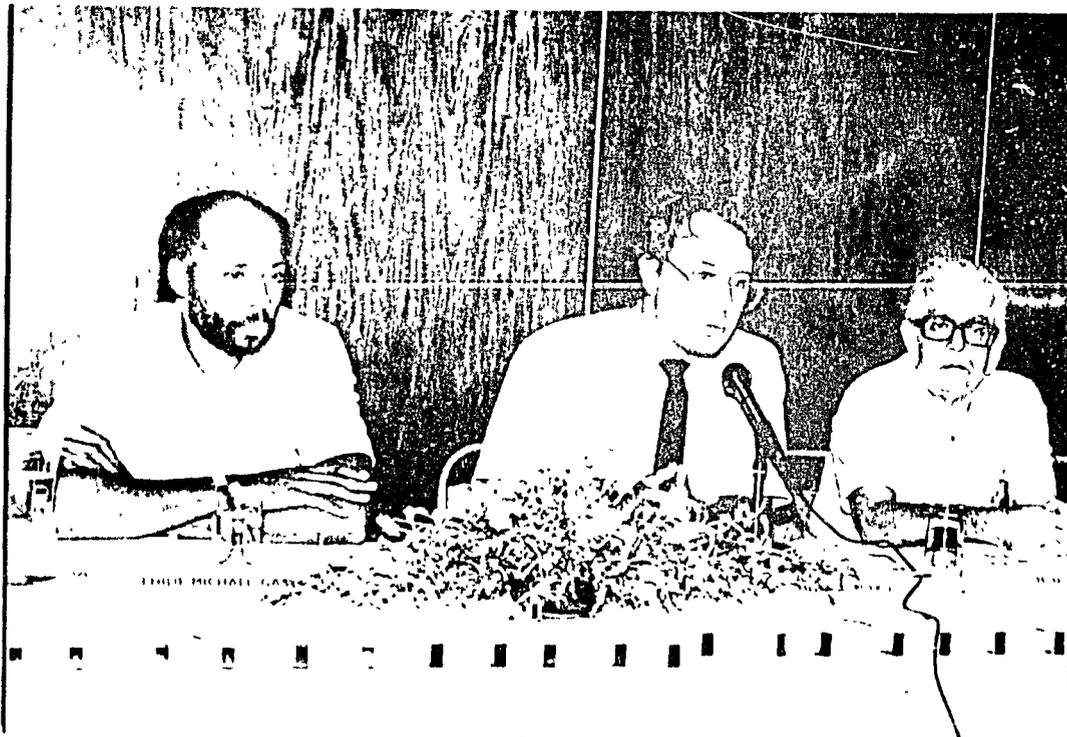
1. The Facilitator a skilled person who can get projects going. May be a project officer, an entrepreneur or a community person.
2. The Community but a pre-requisite for community training in such areas as management is the community's own confidence in themselves. This must be developed prior to training.
3. Professionals
 - a. training in community priorities
 - b. basic training on the job and at the site
 - c. follow-up training away from the job or site (i.e., upgrading of skills)
 - d. information dissemination for continuous training or upgrading of skills
 - e. long-term training for improved efficiency.

TRAINING RESOURCES - (i) in country, (ii) regional, (iii) outside the region

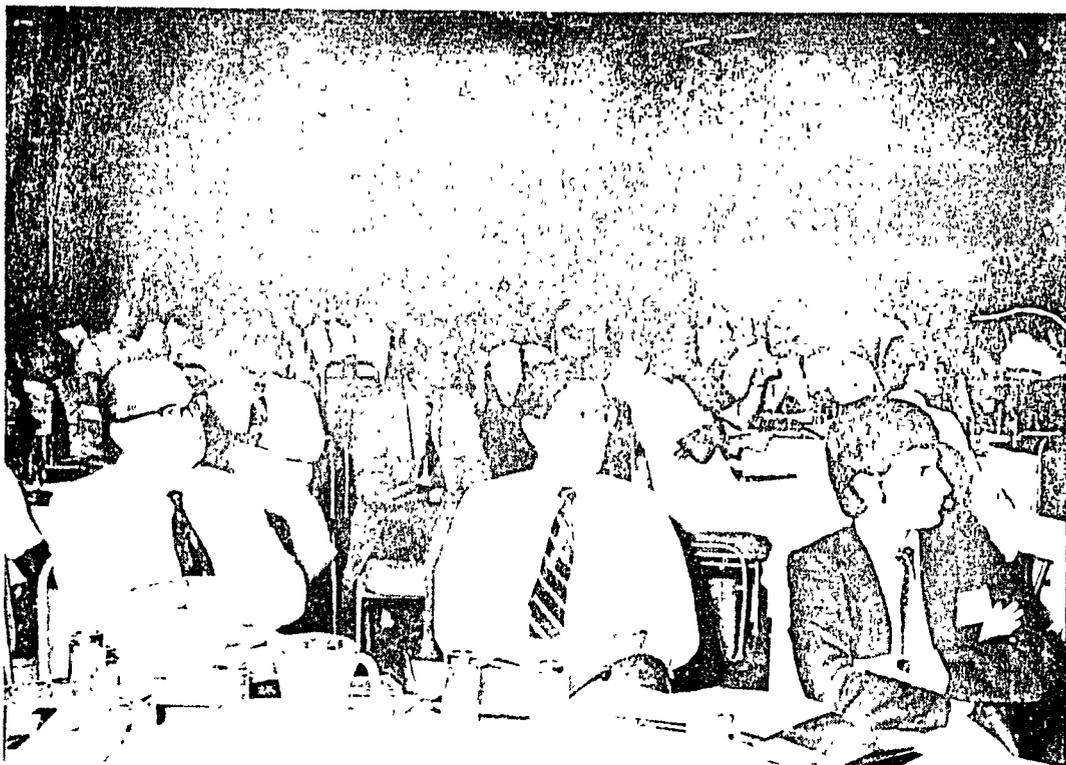
1. a. Training courses for trainees and learners
- b. Training on field in a work situation with individual responsibility and minimal supervision.
2. a. Thailand's National Housing Authority training course for junior professionals - (specific skills related to specific projects for people who already have professional training).
- b. Indonesia - Kampong Improvement Program for government officials and project coordinators - (training in objectives of Kampong, improvement identification of constraints and problems, guidelines for relationship with other agencies, training of site managers in dealing with communities).

C. CONSTRAINTS IN TRAINING

1. Pressure of implementation of work tends to de-prioritise training.
2. Financial constraints - (however, in Indonesia, central budget provides for training).
3. Lack of interest in training stems from decision-makers' failure to see the training as a means of increasing productivity.
4. Failure to maximise benefits of training
 - training for individual careers as against trainers.
 - training to produce marketable commodity in the international market resulting in brain-drain.



5. Plenary Session Address; Edward Popko, Harvard University responds to a question in the presence of H.U. Bijlani, HUDCO and Philip-Michael Gary, Housing Advisor, USAID, Colombo.



6. Delegates to the Plenary Session

A SUMMARY OF PROCEEDINGS
WORKSHOP D:
THE USE OF MINI-COMPUTERS IN SHELTER PROJECT DESIGN

DISCUSSION LEADERS

EDWARD POPKO
H. U. BIJLANI

Dr. Popko provided a general overview of the use of microprocessors in housing projects, and illustrated his talk with 50 slides, concentrating on how microprocessor technology can help with the design and analysis of specific projects.

Small, late-model computers are very sophisticated, affordable, and cost-effective, and are therefore excellent aids to project planning in less developed countries. Although formerly, computers were used mainly in finance and engineering, today's technology and low costs permits their use in a number of new areas, including housing. With units costing between \$.300-6,000, a variety of applications are possible.

Dr. Popko began his slides with a general look at various types of equipment - programmable calculators, mini-computers, and associated hardware and software. Basic computer vocabulary and procedures were explained.

The major part of the presentation which followed consisted on a look at four different current applications of microprocessor technology to housing. The first of these to be discussed by Dr. Popko was the Harvard/MIT project, which uses computers to produce visual models and graphics which are useful to project planners. A series of slides was presented illustrating how the computer can assist in shaping sketches and maps into finished site plans. The point was stressed that the computer enhances and supports the design activity - it does not replace design as an activity.

The next application discussed was the PADCO/Bertaud model which has been adapted now for use with the World Bank. Slides showing the steps in the process of planning and costing housing schemes were presented to illustrate the advantages of the Bertaud program, which essentially combines several variables together to indicate what types of housing solutions are possible within specified cost constraints.

Following this, a programming model developed by the United Nations (the UDMS model) was illustrated and discussed. This program enables the mapping and analysis of spatially - distributed information. The package is especially designed for low-cost equipment using conventional television receivers as a display, on the assumption that this will be most useful and affordable by people in various countries. The system can be made more sophisticated, Dr. Popko pointed out, but it is designed to work on very simple equipment, which is a major advantage. Mr. Popko then asked Mr. Bijlani to elaborate on the HUDCO experience in India using computers in housing.

Dr. Bijlani began by explaining how HUDCO came to use computers in layout work. They had observed, he said, that in typical housing developments, half the cost of the total project was concerned with the housing itself, and that planners and builders had traditionally tried, in low-income programs, to bring these costs down in a variety of ways, often with great success. Neglected, however, had been the fact that land and infrastructure development accounted for the other half of costs.

It had been observed, nevertheless, that certain types of layouts cost substantially less than others. HUDCO therefore began to look closely at this side of the cost equation, in an effort to determine where and how costs could be trimmed. They began with hand-held calculators, working out a series of formulas. This eventually became more sophisticated, and resulted finally in the matrix approach, illustrated in the various documents and publications which had been distributed to workshop participants.

Two variables emerged as being most important in influencing the final cost of a layout - plot size and the cluster ratio of plots. He then went on to illustrate, using the various layouts shown in his book of matrices, how variations in inputs could result in different configurations, and how this could result in a range of costs. He explained how the matrix was structured and how it worked, and also discussed in detail the types of assumptions that had to be made, and the trade-offs inherent in the range of variations.

The question period generated an interesting range of concerns. The questions centered around a set of these, which are summarized briefly below:-

- * Art versus Science: Computer design seems to be transforming subdivision design into a science. What has happened to the art involved ?
- * Popular Participation: How is the relationship between the planner and the man in the street affected by using computers ? Isn't it more difficult to involve people, if machines are doing most of the work ?
- * Geometric Modeling: The computer seems to think mainly in straight lines. Many examples of traditional architecture and settlement planning are more 'natural' in form. Have we given up something here, at the same time as gains in certain directions have been made ?
- * Flat Sites: The examples given seem to be all on flat sites. Can computers cope with slipping or irregular sites ?
- * Irregular Plots: Can computers cope with the irregular lots that are a feature of so many shanty-type settlements ?
- * Changes over Time: Can the HUDCO matrix be programmed to deal with temporal aspects of site development, eg: maintenance over time, staging of infrastructure, etc ?

- * Optimum Designs: Since the prototype designs that were picked to be analysed determine what went into the model, what constitutes a 'good' design to begin with ?
- * Lot Size: The lot seems to be the focus of land optimization. Are there as many choices in the matrix as it seems ?
- * Linearity: The matrix is laid out on plots with very regular and systematic areas. Can a linear relationship, such as plot size, be reconciled with various engineering features like sewerage networks, which are non-linear in cost ?
- * Computer-Planner Relationships: Can the matrix become a substitute for planners' value decisions or professional judgements ?
- * Computers and Politics: How can the rational findings of this research effectively change the political process ? What are the political consequences of being wrong about design? Can design excellence be made a political goal ?

Dr. Bijlani and Prof. Popko both stressed, in their replies to these questions, the following major points: The computer is only a tool, an aid to the planning process. As such, it is limited and incomplete. At the moment, the computer cannot deal in any effective way with irregular lots, sloping sites, etc., unless one is prepared to drastically simplify the information fed into it. As time goes on, computers may become better at dealing with non-regular surfaces, but right now their capabilities are limited. Certain real-world aspects, such as changes over time and non-linear networks, can be programmed in, however. The use of the computer is in no way a substitute for professional judgement; indeed, one must be a better planner than before to be able to use computers effectively. The computer makes professionals more self-conscious about their own assumptions, and by so doing, may actually improve their professional performance.

And to the extent that the computer enables a planner to generate a wide range of alternative layout solutions to his clients, it improves the quality of the relationship between planner and clients. It was stressed in closing, however, that only a limited number of 'values' can be manipulated by computer programs, and that perhaps our present concern with cost and efficiency may, in years to come, be seen as yet another example of the uncritical assumption by Third World planners of certain Western values. At the moment, cost and efficiency are a concern to everyone, but they are not all that matters in the design process.

SLUM AND SHANTY UPGRADING - A SRI LANKA APPROACH

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1. INTRODUCTION

The terms of a new Government of Sri Lanka commenced in mid 1977 with an ambitious commitment to a housing program of 100,000 new units to be accomplished by the end of 1982. While this program was being implemented, there emerged by the side, an approach hitherto little known in the country - improvement and upgrading of slums and shanty settlements, beginning on a modest scale in the City of Colombo.

During the past five years of its growth, significant strides have been made. Its infancy is now over. Relatively simple replicable and cost effective approaches are being developed while constraints are experienced in the organizational and policy aspects. It is inevitable that the program becomes a strong arm of the housing strategy to ensure efficient utilization of resources and replicability on a large scale.

This presentation on the Slum and Shanty Improvement Program is in three parts.

- Firstly, the background preceding its development.
- Secondly, the phase of emergence and creation of its operational framework.
- Thirdly, the type and scope of the upgrading projects and lessons of experience.

2. NATURE AND MAGNITUDE OF THE PROBLEM

2.1 Typology

The existing urban low income housing units can be categorized into two types:-

The slums are mostly old deteriorating tenements and to a lesser degree, subdivided derelict houses. The slum tenements built largely of permanent materials, are very often single roomed and compactly arranged in back to back rows, meant for the accommodation of urban labour force. A cluster of tenement units with definite property boundary is called a "tenement garden". It shares common housing amenities often insufficient and badly maintained. It should be noted that contrary to similar situations elsewhere, at least going by definition, the occupants have some form of tenurial status - owners, tenants, sub-tenants, etc. On considering the tenement area as a whole, the ownership pattern, however, is quite complicated owing to the effects of various housing legislations. Slums in most cases, also have shanties within the common open spaces of the tenement garden -- understandably, to accommodate the households created among the occupants.

The shanties, are improvised and unauthorised shelters, constructed by the urban squatters on state or privately owned land, without any legal right of occupancy. The areas are badly serviced and predominantly insanitary.

2.2 The Magnitude

A field enumeration, carried out by the Colombo Master Plan Project and later by its successor, the Urban Development Authority revealed the number and distribution of the slums and shanties in the City of Colombo.

TABLE 1
SLUMS AND SHANTIES IN THE CITY OF COLOMBO

!-----!	!-----!	!-----!	!-----!
! TYPE	! UNITS	! FAMILIES	! POPULATION !
!-----!	!-----!	!-----!	!-----!
! Slums	! 17,253	! 23,137	! 138,822 !
! Shanties	! 15,951	! 19,608	! 117,648 !
!-----!	!-----!	!-----!	!-----!
! TOTAL	! 33,204	! 42,745	! 256,470 !
!=====!	!=====!	!=====!	!=====!

Source: Ministry of Local Government, Housing and Construction - "Policy Paper - Slums and Shanty Upgrading in Colombo Municipal Council", 1977

The total population of the Colombo Municipal Council are being 580,000 the number of slums and shanties form about 45% of the city population. It is estimated that another 250,000 live under similar conditions in other district towns of Sri Lanka. The city of Colombo also has surprisingly low population growth, the rate being much lower than that of the Colombo District, whereas the peripheral suburban areas show a faster growth rate. The total picture of low income settlements, in relation to the other cities in the South Asian Region is not alarmingly large, but relative to this country - high. With timely interventions it can become a manageable problem. In terms of land ownership 65% of the shanties are on government land and about 40% in annually floodable conditions such as low lying marshes, canal banks, etc. For the slum tenements, the ownership is favorable, with about 13,000 units (76%) being transferred to the owners or vested with the government under the Ceiling on Housing Property Law of 1973.

3. EVOLUTION OF SLUM AND SHANTY IMPROVEMENT PROGRAM

3.1 Conventional Housing Approaches

Quantitatively the performance until 1977 was confined to very low figures of production, including the constructions of private sector. Declining performance in housing was substantially attributed to the stringent housing legislation - Protection of tenants act, Ceiling on housing property Law of 1973 and the like. More-over, approaches to housing continued to be replacement oriented. The conditions in slums and shanties, both physical and socio-economic, were deemed fit for clearance, irrespective of costs and consequences. In this task, the local authorities also joined hands with the National Housing Department and were granted funds for clearance. In fact, Public popularity was claimed through promises of clearance. There were little considerations to deal with the qualitative and quantitative deficiencies of the existing housing stock within the technical and economic constraints and limit the replacement housing to a minimum and maximize net additions of low cost units. With pronouncements and commitments to alleviate the shelter conditions of the poor the successive housing programs continued to be restricted to the same strategies with the last of them exceptional for its extensive scale of production - direct construction for the urban and aided self help for the rural with the modest disbursement of housing loans. Nevertheless, during a rapid phase of housing construction, even the cheapest housing unit proved to be incompatible with the country's and the families' means.

3.2 Emergence of Upgrading Concepts

There was an increasing reference to the problem of slums and shanties, mainly caused by the obvious physical conditions, that it is in the order of half the population of city living in such conditions. Colombo Master Plan Project (predecessor to UDA as a UNDP Project) established one of its priorities for urban action projects in the slums and shanty sector and developed prototypes for upgrading projects in place of expensive replacement housing. This was seen as a vital component and a critical area of activity to improve the urban living conditions.

3.3 The Prototype exercises

The demonstration projects were formulated for a slum tenement garden in the central area and for a suburban shanty settlements of colombo, basically directed to regularise or improve the environmental conditions and provide for adequate common amenities. Fortunately both the sites were either owned by, or vested with the government. By 1978, implementation of the two projects commenced with the assistance of a small team of young graduates, draughtsmen and assistant architects. As the execution was underway, the extent of learning was enormous. Basic judgments, for example, to deal with individual tenement units as part of improvement and the way they were carried out proved ineffective, technically time consuming, financially not affordable (unit costs turned out to be Rs.20,000/=) and beneficiary response, negative.

In total the scope of work was very high and made to arrive at certain fundamental parameters of approach, that is, improvement in tenements will be necessarily restricted to the common areas and amenities. Contrary to this experience, the shanty improvement project proved successful with the right extent of public intervention in low income shanty settlements towards the improved living conditions. Regularisation of the land holdings, minimum dislocation of the shanty structures, provision of basic amenities and granting of security of tenure summed up to show appropriate directions in dealing with shanty areas. However, social promotion activities were little incorporated, primarily due to deficiencies in management capacity.

3.4 The Preliminaries for an extensive work

Simultaneously, preliminary studies and necessary preparatory work were carried out for a larger scale program. For example:

- a) Field enumeration and data collection on slums and shanties in the city of Colombo and certain suburban towns;
- b) preparation of a policy paper designating action types for different locational circumstances;
- c) Building up a unit to deal with this problem area and an operational framework;
- d) Highlighting major issues for further action.

3.5 Decision on action types

Based on the citywide study and from the experiences of the demonstration projects, it was possible to categorise the slums and shanties and arrive at basic decisions.

Shanty settlements within the central areas of the city are not considered for upgrading owing to potential alternative uses and high land values. In such locations, appropriate action is to relocate them with a portion of the proceeds from land sales and development of property. There are areas which need further clarification of potential development or otherwise upgradable. All the other locations can be upgraded. In the case of shanties, the problem of floods and statutory reservations are additional considerations.

For the city of Colombo, the numbers are as follows:

TABLE 2

LOW INCOME SETTLEMENTS CATEGORISED - SLUM AREAS

	Central area upgrading economically not feasible	Further study area upgrading to be confirmed	Upgradable
Units	370 (20%)	1,936 (11%)	15,308 (87%)
Families	412	2,638	20,489
Population	2,472	15,828	122,934

TABLE 3LOW INCOME SETTLEMENTS CATEGORISED - SHANTY AREAS

	!Central !area	!Further !study !area	!Unpro- !tected & !Floodable !- no !upgrading	!Upgrad- !able
!Units	!110(0.6%)	! 546(3.4%)	! 5,921(37%)	! 9,374(59%)
!Families	!146	! 805	! 6,987	!11,670
!Population	!876	!1,830	!41,922	!70,020

The task ahead, then, was to go ahead with appropriate project types for both these problem areas.

4. SCOPE OF SLUM AND SHANTY IMPROVEMENT PROJECTS

4.1 Slum Upgrading Projects - Kew Lane Slum Upgrading Project

4.1.1. The main problem area

Based on our previous experiences and judging by the relative quality of the housing stock, upgrading of the tenement units individually is not necessary for public intervention. But, the common areas and the shared public amenities are: over a period of neglect and ownership conflicts these amenities have deteriorated below basic sanitary levels. As part of improvement, owing to the physical lay-out of the tenement garden, they have to be retained in the present shared basis and confined to small common spaces. There are, however, circumstances with greater flexibility, by virtue of greater extent of open space, to provide more amenities. When spatial conditions are conducive, the standards are brought to stipulated levels. A serious concern had been, the right of access for public agencies - such as local authorities, to intervene in case of very undesirable conditions prevailing in private tenement garden. However, as referred to earlier, the problem is now minimal in slum tenement areas owing to the implementation of Ceiling on Housing Property Law of 1973. Majority of the lands are vested with the Commissioner of National Housing. Those remaining in private ownership are also mainly portions of largely government vested tenement areas. let us consider the first case.

4.1.2. The pattern of ownership

This is a slum tenement area with a clear tenurial status and regular lay-out of units. The units have been either redistributed to the occupants or vested with the Department of National Housing. The public areas and common amenities moreover, remain vested. As such, the improvement to the areas where the amenities are and the passage ways became easy.

4.1.3. The scope of the project

In this project the improvement was exclusively focussed on basic infrastructure and amenities. There were no indications of serious socio-economic deficiencies that warranted attention. The standards of the services were substantially increased at comparatively low costs. The summary details of the project are as follows:-

a) Project area

Total Number of units	251
Families	304
Population	1,924
Extent	3.36 acres

b) Proposed Improvement

	!Standards		!Standards!	
	!before		!after	
	!Used !Unused!			
!Toilets	! 18	! 20	! 45	!
!Bathrooms	! 2	! 12	! 29	!
!Water Taps	! 4	! 8	! 25	!
!Garbage Containers!	! 0	! 3	! 14	!

c) Project Cost

Total Cost	Rs. 650,000.00
Average per Housing unit	Rs 2,590.00

4.1.4. Formulation and execution of the project

The necessary preliminary studies and formulation of construction documents were compiled by the Slum and Shanty Division. During formulation, the project staff had discussed with individual householders with regard to the achievement of an agreeable condition of improvement. The execution of work was entrusted to Common Amenities Board. This organization incidentally a government agency, was established to maintain and provide for, common amenities in housing properties belonging to the National Housing Commissioner. As such they have substantial work experience in vested tenement areas and useful familiarity with small scale contractual supervision.

4.1.5. Project Experience

As evident in the project area plans, there was relatively little difficulty in implementing the improvement program. The physical restrictions to the possible improvements to the passageways were quite in keeping with similar tenement areas. There were obstructive extensions, private enclosures, etc., constructed over a period of time, to accommodate additional needs for space. A Consensus was reached through the discussions organized by the Project Officers that all the extensions should be removed, to make for the paving, construction of drains, provision of stand posts, etc. This was achieved with relatively expeditious way at a low cost. This is a favourable experience as against the other project sites where portions were excluded from upgrading to avoid delay caused by complicating claims of ownership. However, two issues emerged critical.

- a) Cost recovery
- b) Maintenance

4.1.6. Cost Recovery

In relative terms, cost per unit is very low and as such, not considering, cost recovery was alright. However, it would have been possible to consider a recovery through the local authority property taxation, by way of a revision. This was not possible as there is a tax exemption to all properties below and annual value of Rs. 300/=. Almost all the slum tenements fall within this.

4.1.7. Maintenance

The second aspect is maintenance of communally shared amenities. This is being dealt with by community organizations in the form of Maintenance Committees.

4.2. Shanty Improvement Project - Kolonnawa Shanty Improvement Project

4.2.1. The main problem area

The improvement project at Kolonnawa - an Urban Council area in the periphery of Colombo was the very first project carried out in shanty improvement. The objectives were minimum intervention with the settlement lay-out, provision of basic amenities and granting of security of tenure and the exercise has proved to be the best feasible course of action for a number of shanty settlements. The site is an undulating highland of about 10 acres and was squatted for over 25 years. To have about 300 units in about 10 acres, is not in any way a matter for grave concern compared to the acute congestion of squatter areas in the developing cities. But the settlement was deficient in amenities and characteristically branded as a notorious area. With their own commitment to clearance the local authority was getting ready around early 1978, to clear the area to commence constructing thirty low cost houses. With the timely intervention of the Colombo Master Plan officials, the advantages of upgrading all the existing shanty units within the settlement without dislocation were discussed with the local authority and arrangements were made to execute the project with their assistance.

4.2.2. The scope of work

The project activities were mainly to regularize the squatter settlement with an authorised blocking out plan and provide a set of common amenities. However, the standards and norms were greatly relaxed, especially plot sizes and level of infrastructure to achieve cost effectiveness.

a) Project area

Total number of units	...	302
Families	...	364
Population	...	2,084
Extent	...	10 acres

b) Proposed Improvement

	Standards before	Standards after
Toilets	14 Nos.	44 Nos.
Bathing wells	Nil	04 Nos.
Water Taps	07 Nos.	25 Nos.
Street lights	08 Nos.	37 Nos.
Drainage	Nil	3700 L.ft
Tarred Roads & Access paths (with culverts)	---	400 Sq.

c) Project Cost

Total Cost	Rs 1,430,000.00
Average per Housing unit	Rs 4,735.00

4.2.3. Formulation and execution of the project

The improvement drawings, exclusively public works, were prepared by the C.M.P. and entrusted to the Kolonnawa Urban Council (the local authority) which had a nucleus of technical staff to undertake works of this nature. Channelling through the local authority, had the advantages of establishing local contacts with the community in the execution of work.

4.2.4. Project experience

It is with this pilot project, efforts were initiated to make granting some form of security of tenure to the beneficiaries in as many shanty settlements as possible. But restricted to those identified within the upgrading program.

The approval of the Cabinet of Ministers of the Government of Sri Lanka was, therefore, a major step in granting security of tenure to squatters, for example, Leasehold Rights of shanty dwellers.

To quote from the Cabinet Memorandum,

"After careful consideration of possibilities of alternative use and other planning implications it has been decided that a large number of the existing communities should be reclaimed. In the following project areas which are on government or private land, it is proposed that the shanty dwellers are given leasehold rights as an incentive and security for house improvement. In the case of private land, necessary acquisition procedures will be followed. The leasehold right will be offered for a period of 40 (forty) years with conditions against transfer and sale."

Cabinet Memorandum - March 1981

The scope of work and procedures are not restricted to approaches summarized in the above two projects.

4.3 Contribution of Non Governmental Organizations

4.3.1. Greater emphasis on community participation

There are circumstances where the project activities necessarily have to include socio-economic activities such as, health care, vocational training, education etc.

Accordingly, and also subject to the management capacity at present, voluntary bodies and also relevant agencies both governmental and non-governmental are brought together. For example, we are exploring ways of working together with the UNICEF which has a concern for the children of the urban poor - and hence, the communities in slums and shanties.

4.3.2. District operational features

There are non-governmental organizations which work in collaboration with us - such as the U.S. Save the Children Federation and the Redd Barna. They have undertaken specific settlements for upgrading, but with a large proportion reconstructed through self help, in consultation with the U.D.A. and assistance is given in the form of sorting out land issues (including acquisition, preparation of lay-out plans and co-ordinating with other agencies) and able to comprehensively deal with the problems of the settlement, as an integrated community development project, bringing in the community to greater degrees of participation. Moreover, their liberties in financial and administrative procedures remain a great advantage to deal with these critical problem areas - cutting through bureaucratic delay. They are also useful laboratories. For example, the recent draft formulation of a loan scheme for low income households intending to improve or build their shelter is an outcome of the success achieved in the demonstration projects at Kirillapone and Aluthmawatha - executed by the U.S. Save the Children and Redd Barna respectively. The efforts of collaboration are now being extended to further project areas where the capacity of Non-Governmental Organizations will enable greater involvement of target groups.



7. Delegates to the Plenary Session



8. Delegates to the Plenary Session

5. CONCLUSION

5.1. New Directions

The efforts of upgrading are only qualitative. From the new households and also for those whom we categorized within the un-upgradable locations - such as the canal banks there has to be a simultaneously available, sufficient quantity of new plots for means of establishing a shelter, the sites and services are necessary. Pilot projects are being formulated, and the first to be implemented will commence in early January, 1983. A major constraint, however, is the necessity for an expensive reclamation to accommodate the target groups who can afford comparatively little. It is inevitable, therefore, that we link such efforts with profitable uses as well to achieve a differential pricing. At this juncture the critical task is the institution building to undertake this and to do that on an appropriate scale.

In conclusion, I needn't reiterate the significance of upgrading and what it can contribute to, in the current situation of Urban Sri Lanka. The issues and indications referred to are part of its emergence. But what needs to be done is to do it for the less fortunate with little opportunities.

COMPUTERIZATION OF SHELTER PROJECT DESIGN

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In most of the developing countries, there is a large inadequacy of housing both in quantitative terms. Significant percentage of urban population in these developing countries lives in slums and squatter settlements, surrounded by dirt and disease, always exposed to ill effects of epidemics and vagaries of weather.

The housing program in the developing countries is further aggravated by lack of resources, increasing population and very little paying capacity of most of the urban and rural population to pay for the shelter.

The shelter is not only a basic need, but the possession of a shelter is linked in the human psyche with security and respectability. A person who is the owner occupant of a shelter feels personally secure and socially a good citizen of the country. The contrast between the social attitudes of a slum dweller with uncertain tenure of occupancy and the owner of a house amply proves the point. Further, the owner occupant of a shelter is a highly motivated person. He not only tries to save more out of his income for upgrading his dwelling place but also tries to be more productive economically. Possession of shelter with security of tenure also reduces personal and social tensions.

The United Nations Habitat Conference on Human Settlements decided that the "first objective of the human settlement policies of every nation will be to secure a minimum standard of living provision of all basic goods and services to all its living and future people and to restrain excessive consumption by privileged groups until such minimum standards are achieved."

In India the Housing and Urban Development Corporation Ltd. (HUDCO) has been engaged for the past over one decade in the herculean task of providing shelter to the urban and rural poor in the country at an affordable cost. Right from the beginning, it was realised in HUDCO that if it is to meet its objective of providing affordable shelter to the masses, it must explore all the technological options for cost reduction in the field of low income housing. Earlier efforts made by HUDCO in this direction consisted of preparation of low cost house designs and layouts giving emphasis on use of locally available materials and techniques, search for new materials and construction techniques developed by the research organizations and transferring this technology from research laboratories to the sites of HUDCO projects by undertaking demonstration projects. To accomplish this task, HUDCO has a fulfilled Design Development Group consisting of Engineers and Architects which is responsible for research/studies and is constantly in search of new techniques for cost reduction and efficiency in planning and design of shelter projects. Several publications have been brought out by HUDCO on this subject. Considerable economies have been achieved in the housing projects of the country by adopting the above designs and technology advocated by HUDCO and as a result, the average cost per dwelling continued to be at a low level in HUDCO projects in spite of steep rise in cost of materials and labor during the past several years. The above attempt has been so far mainly in the reduction of shelter superstructure cost which also received utmost attention from the research organizations and the emphasis had been on adoption of new materials and techniques in individual superstructure element such as roofing, walling, etc., and not much attention is paid so far on the shelter system as a whole consisting of building superstructure as well as the infrastructure.

It was in the year 1978 that HUDCO raised the issue that not much attention is being given by professionals in India to achieve economies in use of land by adoption of efficient layouts and through that to achieve further economies in the utility networks.

HUDCO also called attention to the fact that land and land development constitute nearly half of the cost of a housing project and sizable economies can be achieved by optimizing use of land and economizing infrastructure costs. Since then HUDCO also started giving emphasis to analyse the combined effect of various components in the housing process and it was felt that instead of attempting economy in the different elements of the housing system in isolation, an integrated system approach to provide affordable shelter should be developed. Certain research studies carried out by HUDCO's Design Development Group also indicated that large economies were possible in the cost of housing if system analysis and optimizing approach was adopted. HUDCO's research team was encouraged by these findings to extend this approach to the analysis and design of entire residential settlements covering land sub-division, utility networks and shelter and to develop a comprehensive model for this purpose and thus help supply of affordable shelter to the urban and rural poor.

CONVENTIONAL PRACTICES AND NEED FOR A NEW METHODOLOGY

Shelter program in many of the developing countries is constrained by number of land use regulations and building and engineering practices which tend to inflate the cost of shelter making this beyond the reach of most of the low income households. For example, planning regulations governing sub-division of land and regarding public open space, street widths, plot sizes, etc., in these countries are mostly based on similar standards adopted in developed countries instead of relating these to the need and affordability of the people for whom these are proposed to be built in a particular country. In fact, standards in most of these countries are typically designed for the low volume, high quality output and are generally defined in terms of products rather than the performance of the particular component duly linked with the need and priority of the people for whom these are intended. As for example, in most of the urban layouts, specifications for roads are prescribed and enforced to cater for large volume of vehicular traffic, even though the people who live in such settlements may use the roads only as pedestrian walkways or at the most as a cycle track and only occasionally emergency vehicles like fire tender, ambulance, etc., may be the only vehicular traffic on the road. Thus, the cost invested on such roads may be a dead investment for most of the people living there. Another example of such inflated-cost-development is the designing of water supply network for much larger consumption per capita, although the existing urban areas may not provide for adequate supply of water for the existing population. This also leads to dead investment and if all such costs could be saved, it would be possible to provide better amenities/larger shelter space to the beneficiaries of such schemes with more satisfying results and large coverage of population with the same investment.

Most of these standards, specifications and practices are planned and enforced by the individual disciplines without regard to their combined impact on the shelter program.

They are generally dependent on the local planning, engineering and architectural practices and the attitude of professional engineers and architects giving excessive emphasis on the technical requirement of individual discipline without any common basis of understanding to achieve the common objective of providing affordable shelter to the urban and rural poor. Since such developments are not affordable by the beneficiary, even if initially they are provided with large amount of subsidy, the maintenance of such developments suffers later with consequent deterioration of the total environment in course of time.

One way of dealing with such a problem has been to relax minimum standards for low cost housing undertaken by some specific public housing agency, but there has been very little effort so far to tackle the problem in an integrated manner by achieving more efficiency in land use planning, more efficient design of utility network, building design and careful selection of engineering specifications and standards keeping in view the needs of the people and their affordability.

In the past, attempt has been made to analyse appropriateness of designs by optimizing individual infrastructure components such as water supply system, road system etc., in isolation from one another. However, it is quite possible that the least cost design for one component may not be consistent with the least cost design of another component. Moreover, the shelter is a multi-disciplinary problem and it is essential that attempt should be made to assess the combined effect of all the elements and testing the same with reference to the common objective of providing affordable shelter to the urban and rural poor.

In the conventional practice, individual site layouts, infrastructure designs, building designs, quantities and cost estimates are prepared to assess the cost effectiveness of some design alternatives but this is time consuming and does not give a complete insight into the whole problem as only a limited number of design options could be assessed in this manner.

The above conventional practice is not only slow and inflexible, it does not indicate clearly the relationship between the various components of the housing system and how sensitive is one to the other and how these could be controlled to arrive at the desired goal of providing shelter to the urban poor.

As earlier explained, various disciplines involved in housing process seem to be pre-occupied with their own notion and professional concern in isolated cells and interest of the poor is neglected. Therefore, there is urgent need of a methodology for analysis and design of shelter with increased speed and flexibility for assessing the housing and urban development standards and practices keeping in view the needs, paying capacity and priority given by the people for whom these are provided and to have a common inter-disciplinary approach. This would not only be a convenient tool for reducing cost to affordable level but will also make it easier for a planner to use his ingenuity to ensure more benefit to the user since the speedy analytical tool will show instantly the result of each planning decision without going through the laborious and time consuming conventional practice described earlier.

CONCEPT OF AN INTEGRATED SYSTEMS APPROACH

Housing is a complex system consisting of a very large number of interacting variables many of which are quantifiable and some defy quantification but all of which contribute to a common purpose of providing shelter to urban poor. The most systematic and rational approach to tackle this problem will be to break up the whole system into its fundamental elements of component parts and thereafter selecting the components and contriving elements, steps and procedures for producing a system that will optimally satisfy the stated goals. This system analysis and design process could also provide a common basis of understanding between various disciplines involved in the housing process and thus help in the decision making process to achieve the stated goals.

The first step in this process is to identify the quantifiable components of the whole integrated system and thereafter identify the set of decision variables (the variables over which a decision maker has complete control and which he can manipulate at will) and the set of 'state variables' (which are dependent on the decision variables and which consequently cannot be directly controlled by the decision maker).

Often the classification of variables into decisions and states is not well defined and depends on the emphasis the decision maker wants to give on a particular variable. As for example, in a plot the plot area, plot width, plot depth and plot ratio are the variables controlling its geometry. If decision is taken on any two of the above variables (which become decision variables), the other two variables will be the state variables. The decision maker should have the freedom to choose the decision variables and state variables keeping in view the situation. This identification of components/variables is a very important step in the analysis process for the particular problem solution and the significance of each variable i.e. how sensitive the problem is to its settings is to be broadly ascertained during this process of identification.

The next step in the process is development of conceptual models which are sufficiently analogous to the real problem but at the same time simple enough to permit quantitative analysis.

Such models could be developed linking the decision and state variables in the various quantifiable components of the housing system covering the affordability, land sub-division, utility network and dwelling superstructure so as to define the shelter in all its physical and financial dimensions. These models could be used to arrive quickly at the desired solution for each component by an iterative process ultimately leading to a complete project design including layout and building designs.

PLANNING AND DESIGN DECISIONS AND AFFORDABLE SHELTER

In recent times, number of authors have attempted to analyse the relationship between the various planning/design decisions with the land use and utility cost parameters of a layout. Caminos based on the design of model layouts selected two extreme models one representing optimum solution and the other deficient solution and used there as a guide to develop a matrix of optimum design indices covering the land utilization, length of public circulation and basic utility network and facilities; which are to be used by a planner/engineer to assess the efficiency of his design. The optimum model selected is of specific size and shape with specific plot size, road widths and semi-public area. In actual practice, particularly in a developing country like India, there is large variation in road widths (from 3m to 24m in normal residential settlements) and the plot size which could be provided within affordable limit is also much less. Similarly, the social facility space and public open space standards vary from place to place and may be as low as 2 to 3 sq.m. per capita or 10 sq.m. to 15 sq.m. per plot (assuming 5 persons per plot) whereas in the optimum layout model selected, this works out to 31.41 sq.m. per plot and minimum road width is 10m and the plot size is 100 sq.m.

In view of large variation particularly in the above parameters in a particular country, a new set of design indices is required to be prepared which again may not be universally applied. Moreover, the real test of a design solution in the context of a developing country is whether the design takes care of the need of the people according to their priority and whether the shelter being provided is affordable. It is quite possible that the above design solution, although affordable, may not satisfy the design indices. As for example, to reduce the cost the plot size may be reduced and as a result the length of network per hectare may be more than the given indices but still it may be an affordable solution whereas adopting the indices the solution may become beyond affordability.

The above model probably is one of the initial attempts to systematically analyse the inter-relationship between the planning and design parameter and the cost parameter in an urban layout and gives some indication about the sensitivity of the land use parameters and utility cost parameter to the plot size and plot ratio adopted, which is a very useful guide for the planner and engineer, but a more comprehensive model is required linking the affordability with the physical parameter of layout to enable a planner to design a physical layout with given standard of social facility space and road standards fulfilling the affordability constraints.

Bertaud in his model attempted to analyse systematically the trade offs between various urban design parameters by linking the financial parameters, cost parameters and land use parameters. This model is used to analyse the trade offs between land use and cost parameters with affordability constraints provided by the financial parameters. Through this process, the user could arrive at target land use, target cost and the planner has to prepare the layout fulfilling the target land use and the engineer has to construct the dwelling and utility network within the target cost.

HUDCO study has indicated that there can be considerable variation in cost for the same plot area and plinth area of dwelling adopting same standards in terms of per capita social facility space and road width-length standards, specification of infrastructure and dwelling structure depending on the actual physical design particularly, the geometrical decisions, wall sharing situations etc. As for example, adopting the raw land cost as Rs. 10 per sq.m., the cost of a 40 sq.m. plot can be Rs. 2710 if a square plot in a square module of 51.97m x 51.97m is adopted as shown in Table I.

This can be reduced to only Rs. 1407 by adoption of slightly higher road widths and consequently larger lengths of road permitting adoption of larger module of 95.45m x 152.72m but keeping the same social facility space standard per plot and the same engineering specification for roads, water supply and sewerage net work and adopting an oblong plot with 1:4 plot ratio but keeping the width of the plot with a minimum permissible width (3m) as per the Indian Code. These are purely planning decisions entirely within the purview of the planner but these make large cost differences. The above cost could be further reduced to only Rs. 1173 if community water supply with hand pump and vernacular type of pit latrine (Ultra Matka) is adopted. On the other hand if the engineering specification of water supply pipeline is changed to cast iron pipes instead of pressure type Asbestos Cement pipe and the minimum size of sewer is changed from 150mm dia. to 250mm dia. as prescribed in certain Municipal Codes, the cost of the same 40 sq.m. plot would increase to Rs. 3354 i.e. 2.86 times the minimum cost of Rs. 1173. Similar cost analysis has been done for 25 sq.m. plot which is shown in Table II. The cost of 25 sq.m. plot varies from Rs. 1072 to Rs. 2592 depending on the planning and engineering decisions. It may be seen that the cost of 25 sq.m. plot in most of the cases is more than that of 40 sq.m. plot which may in the first instance, seem paradoxical but if detailed analysis is done it will be noted that the network cost per plot increases with the reduction in size of plot. This accounts for the above phenomenon of smaller size plot being costlier than slightly larger size plot where higher plot ratio say 1:4 could be adopted but this is not possible in case of very small size plot because of the limitation of minimum plot width (3m in this case). This cost difference can be reduced only if very low engineering specification of utility network is adopted or the raw land cost is very high in which case only the very small size plot may be less costly. But the density in case of smaller size plots is always higher and therefore if one intends to maximise the density he may adopt a very small size plot even if costlier.

In Table III, the range of variation in plot size due to change in planning and engineering decision for the same cost is shown from which it will be seen that for the same cost matrix (i.e. same engineering specification for utility network and raw land cost) the plot area can vary from 31.98 sq.m. to 81.36 sq.m. depending on the design decisions regarding the physical parameters of the layout which are mostly geometrical decisions taken by a planner. If the engineering specifications are also changed the plot size can increase to 107.46 sq.m. and reduce to only 23.97 sq.m. depending on whether lower or higher specification as mentioned above is adopted. In this case also the density gets reduced as the plot size increases and other land use parameters such as marketable land and circulation space are improved. This analysis also indicates that increasing the density does not automatically reduce the cost of plot particularly when dealing with small size plot with moderate cost of raw land and usual engineering specification. In fact, the inter-relationship between the size of plot, engineering specification, space standard and geometrical decisions (like shape of plot, shape and size of module, etc.) and the land use parameter such as amount of marketable land, circulation space, density and the cost of plot, is quite complex and requires thorough analysis to help economical and efficient planning.

In view of the above results, finding the affordable density and plot size on the basis of average cost of land and assumed infrastructure cost per hectare and the percentage open space and circulation space, may not be economical and consistent with the actual physical design particularly for small plot size where the width of the plot cannot be reduced below a certain limit and the plot ratio cannot increase beyond certain limit to permit construction of habitable dwelling and to achieve overall efficiency including the construction of dwelling superstructure and the service connections.

In order to help the planner/engineer to analyse and come to the specific physical design solution, it is desirable to develop models linking the land use parameters/cost parameters with specific physical design solution so that the planner/engineer could find quickly the variety of such design solutions fulfilling the particular constraint/constraints in a given situation and choose the most desirable physical design solution. It is also necessary that the model should include not only the two land uses that is residential and circulation, but all the three types of land uses that is residential, circulation and social facility space generally encountered in residential settlements. It is essential that the physical design model should not only cover all the above land uses, but it should consider the combined effect including the effect of the arrangement of residential blocks and the social facility standard and such modules should be flexible to permit developing a complete layout. Moreover, as explained above, there may be considerable variation in cost for the same plot area and plinth area of dwelling depending on the geometrical decisions particularly, and it is desirable to have a model which will help understand the implications of the geometrical decisions in physical designs of layout and dwelling structure and arrive at the most economical and desirable solution in a particular case giving due consideration to these factors.

Since the alternatives of physical design solutions are innumerable, it is extremely difficult to link deterministically all the possible variety of design solutions with the cost parameter. In view of the above difficulty, generally the unit cost parameters are assumed on the basis of some statistical observation or thumb rule which gives wide range of variations in actual practice.

In the case of low cost housing, all possible sources of cost reduction have to be explored and therefore it becomes imperative to adopt a more precise linkage between the cost parameter and the physical design solution so that a planner/engineer can quickly manipulate his designs and make suitable changes if required after getting instant feedback on cost implications for each of his design decisions during the design process itself rather than the traditional method of preparing individual site layout, infrastructure design, building design, bill of quantities and cost estimates, which is laborious and time consuming. In view of the difficulty in preparing models to cover all possible design solutions, one approach could be to establish linkage between the cost parameter and as many standard design options as possible, and using these models, the initial standard design solution could be arrived at quickly and thereafter this can be suitably adjusted to fulfil the specific requirements in a particular situation without substantially changing the given cost and affordability constraints.

While developing such relationship between the cost parameter and physical design solution, an integrated approach should be adopted covering the affordability, physical layout, building design, engineering specification and standards, etc., in one chain so that the combined effect for all the components in the housing process could be taken into account to facilitate achieving the desired goal. It is in this context that HUDCO has taken up a research study to develop a model which will respond to the above problems.

APPROACH TO DEVELOPMENT OF HUDCO MODEL

In the physical design of shelter, three distinct design processes could be identified, viz:

- (i) design of project layout;
- (ii) design of dwelling structure; and
- (iii) integration of dwelling and layout design.

While preparing the layout plan of a residential settlement in large areas, a planner generally adopts some typical planning modules which are repeated to form an integrated layout. These planning modules can be either in the form of simple block of plots or a combination of these blocks in a certain pattern. Similarly, while designing the dwelling unit, spaces for various uses can be considered as basic modules which are repeated to form the whole of building design. Thus, it is possible to identify a typology of layout modules as well as typology of dwelling designs which could be considered as standard solutions. Once such standard physical design solutions are available, suitable mathematical models could be developed for each of such standard solution linking the cost with the physical design. In order to simplify the matter, a cost matrix could be developed giving the cost of various elements in the physical design, which may be in terms of either unit area or unit length of each component of the system or sub-system.

HUDCO has so far got executed nearly 2000 housing projects throughout India and based on this experience many such standard layout modules have been identified and a typology of such modules has been created. Similarly, based on the above experience, the typology of dwelling unit has also been created particularly for site and services projects and low income housing projects.

It is found that a number of specifications for dwelling unit components and utility network components are repeatedly used in HUDCO projects which could be considered as standard specifications.

Based on this experience a unit cost matrix of a standard set of such specifications with large flexibility of option for each component covering both the structure and the utility network have been developed which are incorporated in one of HUDCO publications. It is clear that many standard shelter design solutions can be defined in terms of above typology of layout modules and dwelling units and the cost matrix satisfying the cost affordability constraint. With this approach, HUDCO has developed a number of mathematical models and computer programs have also been developed for each of the models which can be used in HP41CV programmable hand calculator and thus permit very quick step by step analysis within the given constraints and arrive at the physical design of the building and layout fulfilling these constraints such as affordability. In fact the analysis of 33 layouts incorporated in the Table I, II and III has been done with the help of the above computer programs which took only a few minutes as compared to days and months if the conventional practice of preparing the layout, cost estimates, etc., were followed.

STRUCTURE OF THE HUDCO MODEL

In the shelter design and analysis process normally we come across two types of problems. i.e.

- a) designing the affordable shelter within a given cost (Sub-structure-A) and
- b) finding the cost of shelter of given design (Sub-structure-B).

STRUCTURE A

This sub-model of computer programs has been developed to be used mainly as a tool for design of affordable shelter projects.

Normally, for low cost housing for the urban poor, the affordable cost of the shelter governs the parameters of physical design. This affordable capital cost of shelter could be calculated based on monthly payment, rate of interest and recovery period for each specific case. A computer program has been developed to find affordable cost of shelter with allocation of cost for plot and dwelling structure separately as outputs and the interest rate, recovery period, monthly income, housing expense ratio, etc., as inputs.

Mathematical models and computer programs have been developed for various layout modules where the affordable cost of plot obtained from the above affordability program is one of the inputs besides the road standards, social facility space standards, unit cost of utility network, etc., for which a comprehensive cost matrix with large flexibility in options, has been prepared to cover not only the minimum level and standard level but also the various intermediate incremental stages of development of land and growth stages of dwelling. Thus, with the help of this affordable plot area programs, the layout and the plot area fulfilling the affordable allocated cost of the plot given by the earlier programs, could be defined in physical terms which can be adopted in actual construction with suitable modifications, if necessary.

Taking the allocated cost of the dwelling structure given by the above affordability programs as one of the input, another program for finding the affordable plinth area of one room dwelling for each wall sharing situation, has been developed which could also be used for multi-room dwelling design by suitable allocation of cost for each room. Thus with the help of this program, the building design can be defined in physical terms fulfilling the affordable allocated cost of dwelling structure given by the first program. There are two programs for finding the physical parameters of affordable dwelling, namely, one where the width of the room is the input and the other where the room ratio is the input.

Thus, once the physical parameters of layout and the dwelling design are available, it could be drawn and suitable adjustment could be made, if felt necessary. Thus, with the help of this tool, several design options in terms of project layout shelter design, infrastructure and construction standards could be analysed and affordable and economical design solutions could be arrived at very quickly instead of spending days and weeks for preparing site layouts, building designs, bill of quantities, cost estimates, etc., on various trial and error solutions, as has been the practice so far.

While adopting this method, a planner/engineer has to choose particular diameter of pipe for water supply and sewerage system and adopt the unit cost accordingly, when the actual dimensions of the layout modules, land use parameters such as density, etc., are not defined. After the first layout solution is available as explained the physical dimensions of the layout modules as well as the density, will be available which can be fed as input into the program for water supply and sewerage network design incorporated in the HUDCO Model and suitable check can be made to ascertain whether the diameters earlier chosen are adequate keeping in view the pressure in the water main and the depth of the sewer in the main road.

If it is not adequate, the diameter could be suitably changed and the corrections in the unit cost of the utility network could be made accordingly to arrive at the desired solution which will be consistent with the design of water supply and sewerage network besides the affordability.

STRUCTURE B

This sub-model of computer programs has been developed mainly to be used for project analysis and appraisal.

In order to check the cost effectiveness of a given physical design of a layout and a building design, a number of mathematical models and computer programs have been developed and incorporated in the HUDCO Model where the plot area, plot depth or plot width, road standard, social facility space standard, layout module ratio, unit cost of utility network and the land cost, are the inputs and the cost of the plot, land use parameters including density are the outputs. Similarly, mathematical models and computer programs have been developed to calculate the cost of dwelling when the room area and the width of the room are given inputs, keeping in view the various wall sharing situations, specification of wall and roof, etc. using the above programs, it is possible to arrive at the total cost of shelter of given design. With the help of these programs, it is possible to assess the impact of changes in various road width standards, social facility space standard, utility network standard, etc., on the cost of the plot besides assessing the impact of plot ratio and the module ratio. These programs could be used for analysing a given project and suggesting suitable modification in a given situation. As for example, where the land cost is low, the width of the road may not have considerable impact on the cost of the plot whereas the depth of the plot and the module ratio will have very significant impact on the cost of the plot in most of the situations.

During the process of analysis with the help of these programs, a planner will have complete insight into the inter-action of various variables and how these are affecting ultimate result i.e. cost of the plot and cost of the shelter and it will be easier for him to manipulate these variables and give more emphasis on those factors which are having significant impact on the cost rather than factors which may not have significant impact on the cost in a particular situation, although it may have significant impact on the total environment being created.

The HUDCO Model offers unrestricted choice concerning road widths, social facility space standards, width and depth of the plot (as applicable) between the sides of the module. It also offers a very large number of options in standards of utility network and dwelling structure specification. There is also an unrestricted choice concerning the room ratio, room width and room area (as applicable). However, this is to be checked with reference to the local building code.

Thus the HUDCO Model could be used as a planning tool both for shelter project design as well as for shelter project analysis and the user is given a free hand to adopt any design options, road width and utility network standards, social facility space standards, etc., and obtain the design of shelter with reference to the affordability constraints. HUDCO has also prepared a Handbook Matrix giving ready solution in respect of land use parameters and cost parameters for number of layout modules for specific standards in respect of road width, social facility, utility network, etc., which also could be used as a 'ready planning tool.

At present, the HUDCO Model incorporates programs for limited number of layout modules. However, the studies and development of computer programs on more number of layout modules are in hand which shall be incorporated in future HUDCO publications. Similarly, the model incorporates program for a one-room dwelling unit because priority was accorded to site and services and low income shelter projects.

However, the existing program could be used for design and analysis of multiroom dwelling units also by suitable allocation of cost for each room.

FUTURE PERSPECTIVE

A shelter provided to an individual is a product of a multi-disciplinary exercise covering affordability, social and cultural factors, engineering and architectural planning and design, etc., and if one has to arrive at the optimum shelter solution in a particular situation, one must consider all the above factors step by step in an integrated manner, i.e. an integrated system approach should be adopted. Many of these factors are quantifiable and some are not quantifiable. In the HUDCO Model for computerization of shelter project design, an attempt has been made to quantify as many components as possible in the process of building design and layout plan and linking them into simplified mathematical models to permit this step by step analysis and design process. In the present model, only some directions towards developing this integrated systems approach have been given which are intended to be developed into an integrated system optimization model in future.



9. Delegates to the Plenary Session



10. Participants in panel discussion

MICRO-PROCESSOR APPLICATIONS TO THE DESIGN AND
ANALYSIS OF LOW-INCOME HOUSING IN DEVELOPING COUNTRIES

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BACKGROUND

The effective employment of resources in housing requires planning, management, and daily operations based on reliable information. At first, information technology and computers were applied to accounting and engineering problems because these applications were already highly structured and repetitive, dealt with high volumes of data, required precise results, and could be based on widely accepted procedures and formulas. This generation of computers tended to be expensive main-frame systems administered by a centralized data processing group. Relatively few users outside of finance or engineering ever received direct services.

Today's micro-processors are rapidly changing all of this. This low cost technology is rapidly decentralizing computing and supporting an entirely new user community of managers and planners with direct services ranging from simple word processing to complex modeling and decision analysis. The technology itself is impressive enough, micro-processors have quite literally placed computers in the hands of everyone. But more impressive is the impact it is making in the way housing problems are perceived and alternative solutions proposed. Most authorities today recognize housing as more than shelter and that their intervention in the housing system is limited at best. Micro-processor technology now makes it possible to consider more alternative designs for a project, anticipate the impact of a new mortgage system, or to schedule project advance in accordance to cash flows.

Computer users are changing too. Middle-level managers and high-level policy makers are now joining the engineers and accountants as new users. These new users are creating an unprecedented demand for new software and technical support and traditional data processing groups are poorly prepared to supply it.

The very nature of today's housing policy established the first applications for micro-processors. In the past 20 years, policies have shifted and diversified. Many of today's policies, particularly sites-and-services and upgrading schemes, require the participation of the family to build the needed housing. This introduces more risk in projects because the family's investment decision is subject to a set of market conditions such as rents, labor, and materials cost as well as their shelter needs and financial resources. Most of these conditions are in constant flux.

Planners can no longer assume that the demand for housing is infinite and that any low-income family will benefit from what housing agencies provide. All too often projects fail because they do not anticipate the nature of the demand or the changing conditions within the housing system itself. For these reasons, it's not surprising that the very first applications for micro-processors are in project design, finance, and management.

NEW TOOLS AND RESOURCES

Micro-Processor Technology

In the past five years advances in computer technology, particularly the newer low-cost micro-processors, have introduced a wide array of arithmetic processors, information storage devices, and graphic peripheral equipment. Even hand-held calculators have the capacity to determine project affordability, land prices, mortgage repayment schedules, cash flows, and the cost trade-offs for different subdivision layouts. The more sophisticated micro-processors, often called "personal computers", allow designers to input and analyze subdivision designs, compare the cost/benefits of various infrastructure layouts, and select from alternative sites. These systems are capable of automating the project records such as beneficiary applications, loan repayments, and construction implementation schedules in addition to the applications already available for programmable calculators.

Users write their own programs or purchase small plug-in Read-Only-Memories (ROM) that contain libraries of statistical, financial planning, or engineering programs. Peripherals like magnetic card readers, printers, optical bar-code scanners, and communications links to television sets and larger computer systems make them extremely versatile. Programs and data can be stored and retrieved from miniature magnetic cards, tape cassettes, printed bar-codes, or other calculators and main-frame computers over conventional telephone lines. Equipment located in a design department can be tied into data bases in the engineering and accounting departments thus giving up-to-date information on the progress of projects, the cost-reduction of a new design, or the effects of new field procedures and management practices.

The new micro-processor technology is extremely reliable and has low power requirements. Their compact designs make them practical tools in the field and in situations where there is limited or no vendor support. The cost/performance of today's hardware is rapidly changing -- lower cost high-capacity systems are being announced almost daily.

Micros similar to this one are now being programmed to assist planners in the design, implementation, and evaluation of projects.

Software Shortage

In addition to the computer hardware, there is a growing body of general purpose software to select from. Many financial packages such as accounts receivable, cost/benefit analysis, cash flow analysis and mortgage scheduling are available from hardware manufacturers or other-software vendors for under \$600.

Unfortunately, systems for physical planning, subdivision layout, construction management, land pricing, etc., have been slow in development. This is due, in part, to the specialization of these applications, the limited market, and the general lack of design theory to guide development. Although new computer users can take advantage of existing software for general applications, most will have to write their own project design and management systems or piece one together by integrating routines from other programs.

Those writing their own programs will be confronted with a number of management and technical problems. Personnel with experience in the new technology are in very high demand and there is the constant threat of losing trained staff to higher paying jobs in the private sector. The rapid expansion of the micro-processor industry has created a serious standardization problem too.

Software developed for one machine may not run on another without significant reprogramming, and system programmers will do well to insulate themselves from equipment obsolescence because software development costs will greatly exceed hardware expenditures.

In the absence of planning software, several research and development efforts have been undertaken to explore the practicality and effectiveness of using micro-processor aids for housing design. The most significant efforts are those at Harvard/MIT, the World Bank/PADCO, AID/HUDCO and the United Nations.

HARVARD/MIT PROJECT

Early Research

Early analysis of housing subdivisions (Camino 71, Popko/Kessler 71) indicated that significant cost reductions can be achieved by optimizing the physical labour. To illustrate how dramatic the reductions can be, consider the cost implications for a relatively trivial design decision about which plot area, proportion, and block length is best. The first layout contains 22 square plots, each of 100 square meters. The second design also contains plots of 100 square meters but the linear proportions have been changed from 1:1 to 1:1.25. By changing just the proportions while holding the plot area and block length constant, the second design yields 36 plots while the first yields only 22. The distance between the streets parallel to the short side of the block in the second layout has increased with the deeper plots because the block width has increased from 20 to 33.32 meters. This means the second layout has 30% fewer streets parallel to the long axis of the block than the first. The second layout is significantly cheaper to implement than the first.

An index of efficiency of lineal utilities (e.g., streets, water and sewer lines, or electrical networks) results when the total block circulation length is divided by the block area (Camino 71). This index, called the R factor or the Unit Circulation Length (UCL), is simply the ratio of the total circulation length to the area. UCL's for the two gridiron layouts 6 meters of utilities per hectare for the first design and 3 for the second. The second is therefore twice as efficient as the first because only half the amount of lineal utilities is needed to service the same area.

Using Micro-processors

These early analysis were done entirely by hand. They showed that subdivision design had a dramatic effect on costs that project developers and beneficiaries would have to pay. They also showed the importance of using scientific methods. Unfortunately, the enormous time required for analysis questioned the practicality of such methods. Even methods. Even a simple design case took days to analyze. But, today, micro-processor technology has completely eliminated this barrier. Recently, we programmed a calculator to compute the percent improvement in efficiency (UCL's and percent of land used for streets) for a wide range of plot areas, proportions, and block lengths in gridiron designs. In a few hours, we wrote the program, and computed the efficiency of several hundred variations of a basic gridiron design - work that would have taken weeks now took hours. The program shows that as the plot area, proportion, and block length increase, the total amount of lineal utilities and streets decrease. The result is lower development cost! It also shows that: 1) smaller plots may not always reduce costs to the beneficiary -- they may increase costs because more infrastructure is likely; 2) square plots are very inefficient, and 3) gridiron layouts yield relatively low levels of efficiency even when generous sized plots and long blocks are used (cluster or other multi-circulation subdivision layouts must be used to achieve greater efficiency).

The above analysis demonstrates several advantages of using computer-based techniques. The program was able to recompute hundreds of variations and to test their performance in a few hours. Statistical programs for the same calculator computed a summary equation and the calculator printer was used to output a simple graph displaying the entire analysis. Even a casual inspection of the graph shows where changes in layout will increase efficiency and reduce costs. If the designer must make a trade-off between two or more design parameters for social or financial reasons, he now has a firm basis for deciding.

This kind of decision support was virtually impossible a decade ago but today, anyone can afford the technology and its proper use can make the difference between a project that fails and one that succeeds.

Geometric Models of Design

Actual subdivision design is far more complex than this simple illustration. Often, the outcome is less obvious than in the above gridiron analysis and the designer must frequently go beyond cost considerations and use his judgment to weigh the human factors of the designs he creates. For example, consider the implications of adding just one more parameter to our example -- the slope of the site. For engineering reasons, it is often more economical to place infrastructure parallel to the contours if it is sensitive to gravity. Sewer lines, storm drainage, and water supply generally follow this rule. It is also desirable to run the utility lines along the narrow fronts of the plots in order to serve the greatest number per lineal measure of piping, etc. This geometry implies that the long axis of the plot is perpendicular to the contour lines. The first lot orientation is the most efficient from the standpoint of infrastructure but it is the least desirable for families developing their plots themselves because the orientation maximizes the cut and fill and retaining walls they will have to build. The effect of overemphasizing utility efficiency in this case created additional costs for the home owner -- a very undesirable outcome.

The relationship between utility lines, plot areas, proportions, cut/fill etc. is not a trivial problem. Since land and land development are significant proportions of today's project costs, optimal layouts must do more than minimize infrastructure, they must maximize the land in private ownership, maximize revenue producing properties for municipal authorities, increase the flexibility of project implementation, and allow for progressive development that includes community participation.

Recognizing the dynamic nature of the planning process, and human values associated with it, the author and staff from Harvard's Laboratory for Computer Graphics and the Urban Settlement Design Program at Massachusetts Institute of Technology initiated research on computer-based design models for low-income housing projects.

A model will include basic site development circulation planning, land utilization, street layout, land subdivision and dwelling systems. Its purpose is to determine the social, economic and political implications of alternative designs. Since many participants in the design process do not have technical backgrounds, we felt that graphics should be used wherever possible.

A prototype cluster subdivision with several hundred plots, streets, and a large open space for schools and markets was input and analyzed. The layout is not intended to be a solution to a particular site; it is used only to test the computer program's geometric equations, statistical formulas, and graphics conventions.

In the first experiment, the subdivision design we determined ahead of time. It was input for analysis by sketching the outlines of the block faces, vehicular and pedestrian circulation routes, and the limits of the open spaces using a small electronic "sketch pad" called a digitizer. Basically, the digitizer is connected directly to the computer and, under program control, records the coordinates of the end points of all the lines in the layout. Once the layout is input, a program rectifies it; that is, it straightens irregular lines, eliminates line fragments that result from unintentional overlaps, fills in missing line gaps, and makes intersecting lines perpendicular if they are intended to be so. Rectifying programs greatly speed up input because the designer does not have to be very precise -- the computer will take care of the tedious details.

Another thing the rectifying program does is to number every unique area of polygon within the site. The polygon indentifiers will be used in commands like "DELETE AREA 25" or "MOVE 102 NORTH BY 50 METERS" and as links to geometric information like area, proportion, length, connectivity, or adgency to non-geometric attributes like land use, soil type, property value, or owner.

Integrating the Designer

Note that the program erroneously linked one of the corners of a public toilet facility to the first plot on the end or the bolck, thus closing off the street. Although a very sophisticated coalescing and editing algorithm is programmed, it is still impossible to accurately automate the interpretation of the input. Our experience, thus far, indicates that the best system results when the desiger is an active part of the subdivision description and analysis process. Systems should integrate the designer into the program and allow him to interact with the program at all times, keeping it out of trouble and interjecting his experience and judgment where appropriate.

To demonstrate a possible connection between the geometric properties of the site and basic cost information, we priced all plots on a scale from 0 to 10. The costing algorithm considered only three variables: 1) initial level of public services, 2) accessibility of the plot, and 3) the potential for combind housing/commercial use. Although the image resembles an architectural perspective of row houses, it is actually a three-dimensional histogram. The higher the property value, the higher the bolck-face prism is elevated. It's not surprising to find that the plots on the four outer corners have the highest values while the interior court plots have the lowest. These plots have full services, immediate accessibility and high potential for commercial use.

The interior plots have proportionately lower values because they are accessible only by pedestrian paths and share community toilet-wash facilities.

In actual practice the method for evaluating the property values would be much more complex than shown here. Schemes might integrate layout information with capital gains taxation or valorization systems. Imputed residential values might also be used to attract a broader range of income groups, thus allowing a mechanism for cross-subsidies from higher to lower income groups. This preliminary attempt to link geometry with financial attributes demonstrated that very complex valorization systems are possible.

Additional Work

The research describee here has just begun and the preliminary results are very encouraging. Unfortunately, graphics applications and geometric modeling consume too much computer time. From the cluster experiments, we have learned that usable systems will depend heavily on graphics so we have begun to focus our attention on alternative ways of inputting layouts for analysis. When the geometry of the layout is very regular, this technique requires half the computer memory and computation time as the area sketching technique used in the cluster experiment but much more research is needed before there is a truly practical system for micro-processors.

¹ See the section on the Bertaud Model for differential and land pricing techniques.

WORLD BANK/PADCO

Background

In the late 70's, Alain Bertaud and his colleagues at the Planning and Development Collaborative International (PADCO) undertook the development of mathematical formulas for determining the costs and affordability of alternative housing designs. These formulas were organized into a set of convenient programs for inexpensive programmable calculators. The program set is now called the Bertaud Model. Project designers can use the various programs to make basic decisions about site acquisition, the affordability or particular mixes of infrastructure, and on-plot construction.

Traditional Practices

Traditional project planning often begins with a data collection phase about current housing conditions, user housing needs, and their resources. Often, more data is collected than ever used. Collected data is merged with housing agency information and a preliminary "sketch plan" is created. The designer's attention is largely on site planning, construction methods, and particularly on dwelling unit design if the project is not a sites-and-services project. The design process is one of continuously manipulating the spatial allocation of land, and the specifications for infrastructure according to code requirements and local construction practice.

Once the overall design is committed, a quantities take-off is done to find each project component's cost. These costs become the basis for determining the price to the client. Authorities can subsidize cost items, or re-adjust standards if prices exceed what their clients can afford. They can also offer the project to a higher income group.

The Bertaud Model

The Bertaud Model reverses traditional planning by constraining designs to what beneficiaries can afford. The traditional process starts with a "sketch plan" to be priced -- Bertaud starts with a definition of the maximum financial terms beneficiaries can pay and computes indicators (density and plot size) of what the "sketch plan" should generally be. Bertaud addressed the price question right off rather than at the conclusion of the design quantities-pricing phases. The model itself is simply an accounting mechanism to measure the design effects of changing finance, capital cost (the cost of land, infrastructure, construction, communal facilities etc.), or household characteristics.

The Bertaud process differs from traditional planning in another way -- most of the data collected is market oriented and focuses on the family's alternatives in the overall housing system, slums included. Once prices have been established, the designer essentially manipulates infrastructure and land-use standards to obtain a satisfactory trade-off between financial and physical planning. The "best" design depends on the client's needs and the project's objectives; it might be to maximize the amount of land in private ownership or to minimize the monthly mortgage payment families make.

² Design process comments are from interviews with Alan Bertaud at Harvard University in Cambridge, Massachusetts 1982. Any inaccuracies or misrepresentations are strictly the responsibility of the author, however.

Using the Model

The Bertaud Model can be used in two ways. First, It is a simply set of equations easily unerstood by policy makers. The model is based on the relationship of financial, cost, and land use parameters. The model enables the user to analyze the trade-offs between land use and cost within the constraints given by the financial parameters. The model offers the designer an enormously powerful decision aid, particularly in the initial design phase.

Second, the model is an extremely good vehicle for dialoge between planners. Today's projects tend to be designed and implemented by multi-disciplinary teams. All too often, there is little basis for members to interact effectively or to see the results of their input. Unless team members are aware of their own decision processes and know what data they need, they tend to collect quantities of needless facts that often mask valuable information. Using computers in these situations helps to make the design experience more cumulative and productive because each team member is forcdd to iterpret his professional values in commonly understood performance measures (i.e. cost reduction at the highest quality standrd possible).

Model Components

The most widely available version of the Bertaud Model has seven programs (PADCO 80): ³

Program I

Program I is the most important and is used to assess the trade-off between the financial terms, design standards, and land use parameters of the design. It determines the plot size and density affordable to a specific income group given a monthly mortgage payment and other parameters such as financial variables, unit costs, and design standards.

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³ The Bank has recently published an improved Bertaud Model manual and user guide; see World Bank 81.

Users can also choose either density or monthly payment as the independent variable and compute the values of the other two. This program assumes a gridiron subdivision design is being used.

The lines from 1 to 20 are required model data values. Normally the model user checks a design alternative (vertical column 1 to 9) by inputting financial data on amount beneficiaries spend on utilities, housing, and transportation. The percentage of their income spent on housing is determined by estimating a typical family budget. Rent levels for the target group are estimated from studies of the informal housing market. The maximum monthly payment and possible down payment for new housing is then estimated.

In addition to the household characteristics, the rate of interest (including management and administrative costs), the recovery period for capital funds, and the capital recovery factor must be decided. Financial terms are often policy decisions of the institution implementing the project and might be fixed by foreign banks or development agencies. The resulting values are entered on lines 1 to 4. The model then computes the capital available per household -- k . " k " is the net present value of the mortgage stream at the stated interest, recovery period, and down payment -- it is also the maximum house in current prices that families can afford. ⁴

⁴ Since the capital available per household is so important in determining what beneficiaries will receive, Bartaud supplies a graduated payment loan (program VII) as an alternative.

Once the designer determines the total capital per household he must allocate the capital among various project costs. Land costs, on-site and off-site infrastructure costs, construction and community facilities costs, and special features costs must be estimated. For purposes of initial project planning, the Bertaud Model does not consider an actual subdivision at all. Instead it assumes a default grid-iron layout. This approach shortens the initial planning stage by eliminating the traditional "sketch planning" phase but it also makes two assumptions:

1) that the differences between designs are not significant enough to be of concern in early project planning, and 2) that estimated of costs (line items 7 to 14) can be approximated from previous projects implemented under similar circumstances. Designers may find, however, that they still need to prepare sketch-plans for each site being considered in order to make acceptable cost estimates. ⁵

Although the designer typically computes the overall density (persons per hectare) and the plot size (square meters) that families can afford. He can choose any one of the three variables as the dependent variable and use the model to compute the other two. For example, the plot size might be the most important decision variable for project beneficiaries. The designer can input the plot size and use the model to determine the resulting density and total capital required per household. This cyclic doing-redoing is the essence of examining the principal trade-offs between project parameters and using the model.

⁵ Preliminary results from the Harvard/MIT project described earlier indicate that the cost variance for alternative designs on the same site are significant. Estimating project costs from historical records is speculative at best.

Program II

Program II is a more precise determination of design standards and infrastructure costs. Although the Bertaud Model assumes a standard gridiron subdivision, the designer can use Program II to make some improvements in it. Output from an improved layout can be re-input into Program I resulting in more precise affordability estimates. We already showed that street width, block length, and plot ratio affect the costs for services by changing the total circulation space and network length on the site. A large number of plot size, ratios, and block lengths were input into Program II and the effect on circulation space (p), network length per meter square of site (t), and on-site infrastructure cost (c1) were plotted.

⁶ Although some cost savings resulted by increasing all three layout variables, the improvement is not very dramatic and occurs only in a narrow range of combinations. Bertaud recognizes the limits of gridiron design and has worked with the National Housing Authority of Thailand to consider other layouts.

⁶ The test was performed by writing a driver program that called Program II as a sub-program and passed it values for plot size (j), plot ratio (x), and block length (w). The width of primary and secondary streets (u,v) and the costs of utilities (c³,c⁴) were held constant for purposes of comparison. Model output for circulation space (p), network length (t), and on-site infrastructure cost (c1) were recorded and input to a graphing program. The entire analysis was done with a pocket calculator and an attached printer.

Program III

Program III calculates the number of plots of each size which can be designed into a project where values for Program I and the desired plot distribution are known. This program is particularly useful in determining if higher-income groups within a project could cross-subsidize lower-income families, thus allowing projects to reach lower-income groups while keeping the project self-financing.

Program IV

Program IV determines the feasibility of walk-up apartments. Quite often, the designer must evaluate whether more intensive use of land and infrastructure compensates for the higher unit costs of multi-story construction. This program determines the apartment size possible, given financial constraints and costs for construction, infrastructure and land.

Program V

Program V calculates housing subsidies. "Housing programs frequently contain elements of both capital and interest subsidies. Sometimes the capital costs of land, infrastructure or housing are not fully charged; interest rates are frequently less than the actual cost of the opportunity cost of capital. This program enables the calculation of the amount of subsidy when both types of subsidy are present (PADCO 80). The interest subsidy portion is discounted to the immediate present value of the loss for making the loan and combined with the capital subsidy. The effect of down payments on subsidy and the present value amount of the subsidy is also calculated" (PADCO 80).

Program VI

Program VI estimated the cash flow implications of different housing programs. "Many housing authorities require annual infusions of government capital, especially when large subsidy elements are present. Program VI can estimate the amount of annual capital in addition to the borrowing indicated below which will be required to maintain a housing program, given values for the following:

- 1) the cost and densities of the proposed housing
- 2) the number of units to be produced per year
- 3) the percentage of each year's program cost to be financed from borrowings
- 4) the financial terms to be offered beneficiaries, including down payments
- 5) the terms paid for borrowings by the institution
- 6) the percentage of capital subsidy, if any

The program can also discount the cash flow to show the additional capital required per year in real terms if inflation is anticipated" (PADCO 80).

Program VII

Program VII computes the capital available per household using graduated payment loans. In some countries, graduated payment loans are a reasonable way to recover project costs where there is serious inflation. The program computes the increase in monthly payments for a range of years. This technique is only appropriate where household incomes rise by the same percent as the payment.

7 This program was developed by Alain Bertaud, Marie-Agnes Bertaud and the staff of the National Housing Authority of Thailand under a contract with PADCO.

Future Enhancements

Research and development is continuing on the Bertuad Model. The World Bank in collaboration with PADCO has expanded the user's manual, consolidated several programs, and included new programs for analyzing non-gridiron layouts.⁷ Several new versions are programmed for the newer series pocket calculators with alphabetic displays and the larger desk-top micro-processors.⁸

Research is underway to develop a "second generation" model which would extend analysis to the detailed design and engineering specifications. Together, they have a large impact on project costs and a model would be useful in the analysis of the financial and economic aspects of existing development regulations and engineering practices.

⁸ Hewlett-Packard HP-41C/CV programmable calculators and the HP-85 Personal Computer with VisiCalc PLUS spread sheet software.

⁹ Cluster layout proposed by the National Housing Authority, Bangkok, Thailand.

AID/HUDCO PROJECT**Low-Income Housing in India**

In 1981, the Office of Housing (AID) and the Housing and Urban Development Corporation (HUDCO) of the Ministry of works and Housing in India undertook a research and development program, computer equipment acquisition, and a training program aimed at improving project identification, project design, and project analysis for low-income housing in India. This project is the subject of H.U. Bijlani's conference presentation entitled "Computerization of Shelter Project Design" and is referenced here for completeness. ¹⁰

HUDCO Programs

HUDCO, through state and local housing agencies, has sponsored more than 1,750 projects in about 400 cities, towns and rural areas. HUDCO's projects are almost exclusively directed towards India's low-income urban population. The AID grant will assist HUDCO in this effort by developing a package of micro-computer based models and programs for shelter project identification, design, and analysis. The models will permit the comparative analysis of alternative physical designs, and costs by utilizing computer technology. Development, of such systems with analysis capability would significantly expand HUDCO's capacity to develop housing projects which meet the physical, social and economic needs of HUDCO's target income groups.

¹⁰ H.U. Bijlani New Delhi: Housing and Urban Development Corporation, Third Conference on Housing in Asia. Jointly Sponsored by U.S. Agency for International Development and the Government of Sri Lanka in Colombo, October 11-14, 1982.

Computer-Based Project Design and Analysis

Through the medium of training programs including workshops, seminars and field applications, HUDCO would transfer the project design and analysis technology to the state and local housing institutions which are its clients. These institutions must in the first instance identify, analyze and design shelter projects which are affordable for the intended target groups and meet the cost and physical design criteria established as part of the government of India's housing policy. Development of this capability will also assist HUDCO in continuously refining and tailoring project design criteria as various cost elements and physical design characteristics change. In this regard, the use of computer technology will permit HUDCO and the state and local housing authorities to analyze the multiple design variables encountered in shelter projects including the alternative site planning, plot sizes, cross subsidies, densities, and level and standard of infrastructure vis-a-vis basic affordability criteria for the intended target group.

The project will initially assist HUDCO to design a computer program to permit post facto analysis of approximately 125 existing projects benefiting different income groups for the purpose of development of a reference matrix for project designers which would quantify trade-offs among:

- 1) affordability, physical standards, land and related costs;
- 2) cost of infrastructure standards, per linear meter of network and per square meter of circulation surfacing;
- 3) cost of on-site infrastructure per square meter to a given combination of land use and infrastructure standards;
- 4) appropriate superstructure standards-connection costs for each infrastructure adopted;
- 5) project viability and composition of projects in terms of different income groups.

The project will also result in the design of micro-processor programs, to permit individual project design and financial analysis utilizing hand calculators. Software development will be upgraded to be operated on micro-processors with graphics attachments capable of inputting site plans and graphic displays that summarize the optimal relationships of physical design parameters and cost constraints.

An Initial System

To date, HUDCO has reviewed a number of former projects, analyzed a number of physical design combinations, initiated staff training in computer aided design, and proposed the logic of their project design and evaluation model. Equations have been developed for simple cul-de-sac clusters that summarize the effects of changing plot areas, road widths, and per capita public facility areas. The cluster studies are being expanded to cover different forms of grouping patterns (HUDCO 82).

UNITED NATIONS

Information Concepts for Human Settlements

In 1979, the United Nations Centre for Human Settlements (Habitat) undertook the development of data management systems for urban and regional planning.. The Habitat group began by examining the policy aspects of data management in a number of governmental sites where computer-based systems were being used. After reviewing a number of actual systems, they concluded that the weakest link in an information system is the interface between the technological components of the system and the people who will use the information which the system produces. To overcome this problem, the Habitat group developed a primer entitled "Data Management for Urban and Regional Development". (United Nations 81). It describes the methodology and techniques for constructing an information system and identifies the operational issues selecting computer technology and managing it.

In addition to the primer, the group has released the first version of a micro-processor computer program for mapping and analyzing specially distributed information. UDMS was specifically designed for the newer low-cost micro-processors which use conventional black and white or color television monitors for display. 11.

The UDMS Package

The Urban Data Management Software Package (UDMS) is a collection of utility programs for general applications in urban planning.

11 UDMS is written in BASIC language and requires CP/M operating system control. See United National 81 for minimum hardware and operating systems requirements.

The four main utilities are: 1) geographic data-base creation, 2) mapping, 3) special searches and transformation, and 4) special data description and analysis. Each utility option is accessed in hierarchical order by indicating its number from a menu and the requested operation is performed. Output may be a map, a statistical report of a variable, or the removal of errors from a file depending on the option and sub-option and sub-option invoked.

Data Base Creation

This is the most basic option within UDMS because all other options operate on the coordinate directories, region definitions, and variable data files created here. Under this optional the user can create, edit, and display area-based or network-based information. Area data are distributed and organized by discrete polygons defined by either natural boundaries or some other form of closure. Land use parcels, site boundaries, political boundaries, and cadastral registry (property ownership), are examples. Sewerage lines, electrical and water supply, and vehicular and pedestrian circulation routes are all networks. UDMS allows the user to create geographic base files for either of these two types and a set of options can update and compute coordinate directories, polygon definitions, and network distances.

Mapping

Two types of map displays are possible: boundary or thematic. Boundary maps are used to check the coordinate descriptions of the polygon areas in the data base. The method for defining areas is to traverse the polygon in clock-wise direction inputting sufficient coordinate pairs to describe the boundary. This process is repeated for each polygon in the data base. Without accurate control of the coordinate input, it is possible to inadvertently overlap or to unintentionally separate adjacent polygons. Boundary maps are a means of checking that the base file is correct.

Thematic maps are choropleth maps of polygon-based data and are the most useful of the mapping displays. Essentially, this kind of map associates a data value with each discrete area. The values are rank-order, scaled, and assigned a user-defined display symbol. The map coordinates are scaled to fit the display area and the program then fills in the various areas with symbols which correspond to the data value associated with that polygon.

Spatial Searches and Transformation

Several useful spatial searches and transformations are possible with UDMS: search for point(s) in a circle, search for point(s) in a polygon, and grid overlay onto a polygon. In the first sub-option, the user inputs the centroid and radius of circle. The program then prints only those points that fall within the user's point coordinate file (created by other UDMS options). The second sub-option operates in a similar way but a user-defined polygon is used instead of a circle. Grid overlays onto polygon(s) are transformations where sampling or change of data model is required. A user-defined grid overlays one or more polygons and the program reports the number of grid cells that fall within the boundary. This transformation is most useful in area calculation, data sampling, and data conversion from one data convention to another like grid to polygon or vice versa.

Spatial Data Description and Analysis

Although information retrieval and display tend to be the most common options needed, UDMS has options to analyze information too. Sub-options have been developed for simple descriptive statistics like minimum, maximum, range, mean, variance, standard deviation, and coefficient of variation of any variable in the data base. Simple bivariate linear regression can be performed on any pair of variables in the data base.

The only input required is the variable data file and the program solves, using the least squares estimation, the equation:

$$Y = A + B(X)$$

Where Y is the dependent variable, X is the independent, and A and B are constants. Spatial statistics like x/y coordinates for polygon centroids, polygon perimeters, and the area of polygons can also be computed.

Facility locations often require the analysis of the costs of overcoming the distances between things -- warehouses to suppliers, workers to sources of employment, and families to local or regional shopping centres. Gravity model and network-path analysis options in UDMS can be used to determine inefficiencies in service distribution or find new facility locations. Gravity distributions are measures of attractiveness of a location as a function of characteristics values in surrounding locations. A gravity model is like an arrangement of magnets of different sizes on a table; larger magnets having more attractive force than smaller ones. Each magnet will attract all the other magnets located within a certain radius of it. Their attractions is directly related to their size and inversely proportional to the distances separating them. Gravity distributions can be made of any spatial variable but the most meaningful analysis involve facilities that draw upon a service area like schools, markets, or health clinics.

UDMS has several options to optimize single or multiple facilities on a network. A network is a set of linear elements such as roads, sewer lines, or water pipes that link together points in a region. Locational algorithms such as the shortest path through a network can be used to evaluate the efficiency of infrastructure networks or plan service delivery routes.

- I Data Checking and Geo-Based file Creation
 - A. Coordinate Directory Check & Region Creation
 - B. Polygon Definition Check
 - C. Network Distances File Creation
- II Mapping
 - A. Boundary Maps or Overlay Maps of Networks or Points
 - B. Thematic Maps
- III Spatial Searches and Transformations
 - A. Search for Point(s) in a Circle
 - B. Search for Point(s) in a Polygon
 - C. Grid Overlay onto a Polygon
- IV Spatial Data Analysis and Description
 - A. Descriptive Statistics for Variables
 - B. Geometric Representation of Regions
 - C. Simple Linear Regression
 - D. Gravity Model Distributions
 - E. Optimum Facility Location
 - 1. On a Plane
 - a) Single Location Problem
 - b) Multiple Location Problem
 - 2. On a Network
 - F. Shortest Path Through a Network Algorithm

SUMMARY AND CONCLUSIONS

Micro-processor applications to the design and analysis of low-income housing in developing countries is a new experience. The first applications of the new technology is a direct result of new housing policies that are trying to be more cost effective.

The first three systems described here focused on the financial aspects of subdivision layouts. The Harvard/MIT research is attempting to build geometric models so that micro-processors can graphically communicate with designers. The Bertaud Model provides an accounting mechanism for balancing capital program expenditures in project with what families can afford to pay. The second generation model will further define affordability estimates by including building codes and engineering specifications, HUDCO'S initial system is combining features from both Harvard and the Bertaud Model with their own procedures of design. They combine geometric modeling with cost accounting to facilitate loan appraisals and to suggest design improvements to their client agencies. the United Nations UDMS Package contributes a body of useful utilities for spatial planning and inventory applications. The package is an excellent way to analyze new project sites and to locate community facilities like schools or health clinics.

The applications reviewed here are based on a wide range of micro-processors. The Bertaud Model uses programmable pocket calculators and small desk-top micros, the UN's system and Harvard's experiments are aimed at personal computers, and the HUDCO system will be implemented on a small mini-computer. Investment-wise, the range is about \$600, \$5,000 and \$30,000 respectively.

The focus of this paper has been on the application of micro-processor technology. Although the technology is often the starting point for many housing institutions, the process by which they build their systems and the organizational context which constrains and directs computer use is usually more important to success.

It is particularly important that systems planning always consider the people affected and the organizational climate in which computer aids will be used. The applications described here cut across traditional organizational lines and imply, functional redefinitions for individuals as well as entire departments. Although job obsolescence is a real concern to employees in agencies that begin to use computers, the truth is that computers have not made any significant impact on staffing. Their real impact has been to shift the nature of people's work from routine transactions processing to more broadly integrated applications that require abstract analytical skills. The applications described here show that interdisciplinary teams rather than isolated specialization will be required to build and operate systems. the continual participation of different groups to maintain upto-date data will require considerable interpersonal skills to keep systems running and to continuously modify them to meet changing needs. Beyond the obvious equipment and programming training, users will need considerable technical assistance in analytic methods and management practice. The United Nations' primer is certainly a welcome resource (United Nations 81) but much more is needed to show how to apply the new technology to housing problems. Fortunately for us, however, micro-processors themselves are one of the lowest cost pedagogical means for training we expect that programs will soon appear to help users think algorithmically and work in a cumulative way.

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11. Secretary to the Ministry of Finance & Planning Mr. w.M. Tilakaratne, Sri Lanka addresses the conference flanked by Albert W. Votaw, Assistant Director, USAID's Regional Office of Housing and Urban Programs, Bangkok.



12. Mr. Claude Bovet, Consultant to U.S. National Savings and Loan League addresses the conference.

"LOOKING AT SRI LANKA HOUSING FINANCE"

PRESENTED BY: MR. TILLAKARATNE
SECRETARY
MINISTRY OF FINANCE
GOVERNMENT OF SRI LANKA

In Sri Lanka, as in most other developing countries, housing has been a problem of increasing dimensions. It has been estimated that demand for houses in Sri Lanka increases annually by about 50,000 units in urban areas and by about 100,000 units in the rural areas. The backlog of housing at the end of 1980 has been estimated at 440,000 units of which some 60 percent were in the urban areas. This unsatisfactory situation is attributable primarily to the rapid growth of population in the 1950's and 60's and low levels of investment in housing development during this period, and, in the last few years, to a steep increase in construction costs. While the public sector's contribution has been inadequate, private sector construction has also not responded because of regulatory legislation, such as rent control, ceiling on ownership of houses etc.

After 1978, investment in housing development was accorded high priority in the Public Investment Program of the Government. In fact, Housing and Urban Development was made one of the three lead projects of the Government, the other two being the Accelerated Mahaweli Development Program and Free Trade Zone. The Government embarked on an ambitious program for the construction of 100,000 houses during the period 1979-1983. Under this program, 50,000 units were to be provided under what is known as the 'Aided Self' Help Scheme', in which the Government meets the cost of land development, building materials and certain other auxiliary services, while the beneficiary provides the labor. Another 36,000 units were to be constructed under the Direct Construction Scheme, mainly aimed to benefit the low income groups in urban and semi-urban areas. The balance 14,000 units were to be build under a housing loan scheme whereby those who owned land could obtain loans from the Department of National Housing for house construction.

The Government also set up the National Housing Development Authority (NHDA) in 1978 to implement the Government's housing program. The Urban Development Authority (UDA) which was also set up in 1978 to implement among other new strategies in housing the promotion of private sector investment in Urban and Housing Development Projects, also has as its objective, a slum and shanty upgrading program. Both are considered of very significant importance in the improvement of the housing situation. The objectives of the Common Amenities Board, which was set up in 1973 to maintain common amenities in government vested property, were significantly broadened to ensure its active participation in the upgrading of slums and shanties in the cities and the provision of amenities to the dwellers.

The Government also took several steps to encourage private investment in the housing sector. These included amendements to the Ceiling on Housing Property Law and the Rent Act and the introduction of certain tax concessions.

Housing construction has achieved good progress since 1978, with 65,482 housing units being completed by July 1982. The progress achieved would have been even more remarkable out for the serious imbalance that emerged in 1980 in the Government budget. The government had not only to scale down Government expenditures as a whole but also to rethink its priorities in terms of public sector investment, in order to meet the emerging problems of inflation and balance of payments. The axe had, therefore, fallen heavily on Government investment in the area of housing.

The rapid escalation of construction costs and the high cost of borrowing seems to have caused a marked slow-down in housing activity in the private sector too. An index of the cost of construction of houses, prepared by the Central Bank with October 1979 as the base month shows an increase of 80.9 basis points upto June 1982.

In the absence of an index covering the whole country, the number of approvals by the Colombo Municipality taken as a crude indicator shows that the building activity which reached a peak in 1980 has positively levelled off in 1981. Compared with 1,134 new approvals of building plans in the previous years, there were 1,140 approvals in 1981 of which, however, nearly one-half were in respect of alterations and additions. Whilst approvals for additions and alterations showed an increase of 16 percent in comparison with the figure for 1980, the number of approvals in respect of new construction of houses, flats, commercial and industrial buildings registered a drop of 11 percent in 1981. Another factor that contributed to the decrease in the building of new housing units in the Colombo Municipal area was scarcity of buildable land. The likelihood of a shift in the location of construction activity seems a possible new development in the housing sector.

Let's now look at the institutional facilities available in Sri Lanka for the financing of private sector housing. We do not have in this country an organized system specially developed for the provision of housing finance, like the building societies in the U.K. or the savings and loan associations in the U.S.A. However, the various institutions that constitute the financial system of the country do provide loans for housing, as a part of their total operations, while one institution, the State Mortgage and Investment Bank, engages itself primarily in providing housing finance. The latter is for all intents and purposes a housing bank. The capital market in Sri Lanka is in its early stages of development and there is no secondary market available for mortgages or housing bonds.

The commercial banking system can for our purposes be broadly divided into three groups - (1) State-owned banks, (2) Sri Lankan private banks and (3) Branches of foreign banks. None of the foreign bank branches are involved in the provision of housing finance.

While the two Sri Lankan private banks participate in a very limited way in housing loans, the two State-owned banks have been playing a more important role in the area. Arising from the extreme overall credit stringency that developed in 1981, one of the State banks - the Bank of Ceylon - has discontinued the grant of loans for housing from June 1981, at which time its outstanding loans for this purpose amounted to about Rs. 325 Million, which was less than 5 percent of its total loans and advances. The other State bank - the People's Bank - continues to grant housing loans on a limited scale, the outstanding amount of which as at the end of March 1982 was Rs. 775 Million. This was about 10 percent of the Bank's total loans and advances outstanding at that date. It is known that commercial banks in general do not wish to commit any significant part of their resources in longer term lending for considerations of liquidity, and, particularly in a time of high and volatile interest rates, a 15 or 20 year commitment would not be appealing to them.

The National Savings Bank also has assisted in the provision of housing finance, again in a very limited way. This is an institution that was set up for the specific purpose of mobilizing domestic savings and channelling them for purposes of national development. While the performance of the Bank in the task of mobilizing savings has been creditable, it is required by law to invest not less than 60 percent of its total deposits in Government and/or Government guaranteed securities. In practice, however, arising from the exigencies of Government finance, more than 90 percent of the bank's deposits are invested in such securities at the present time. Its direct investment in housing loans is only about 5 percent of its total deposits. The National Savings Bank, however, supports the activities of the State Mortgage and Investment Bank through purchase of its debentures.

The Insurance Corporation of Sri Lanka grants loans for housing purposes to its life policy holders as well as to its employees, but the amount granted annually has not been very significant.

Housing finance is also provided, again in a very modest scale by finance companies, private provident funds and by companies under their housing loan scheme for employees.

By far the largest amount of housing finance at present comes from the Government's direct financing programs. The National Housing Development Authority makes and administers loans of funds provided by the government. The National Housing Department manages the National Housing Fund Loans. The total amounts of financing provided under these programs are in the region of Rs. 700 - 800 Million per year. Government programs for housing fall into four broad categories. The Aided Sepf-Help Programs provides financing for a package of building material to the value of about Rs. 25,000 repayable at the rate of Rs. 50 per month for 30 years. The Urban Oriented Direct Construction Program provides finance at interest rates varying from 6 - 12 percent. Loans under the Urban Loans Program to finance houses for families owning their own lands carry interest rates of a maximum of 9 percent. Clearly in all these programs there is a very high element of subsidy at the current market rates of interest. It would also appear that there is room for increased efficiency in the administration of these programs and it has been felt that this objective could be achieved by transferring such functions to a financial institutions.

The only financial institution that is primarily engaged in the provision of housing finance, as we noted earlier, is the State Mortgage and Investment Bank, which commenced operations in 1979 by the amalgamation of the Ceylon State Mortgage Bank and the Agricultural and Industrial Credit Corporation whose origins date back to the pre-war period.

This bank grants loans for the following purposes:-

- (a) Construction of new dwelling houses.
- (b) Extension of existing dwelling houses.
- (c) Purchase of building sites for construction of dwelling houses.
- (d) Purchase of house properties and agricultural lands.
- (e) Agricultural development and agro-industries.
- (f) Redemption of debt incurred in connection with any of the above purposes.

The Authorised Capital of the Bank is Rs. 200 Million of which Rs. 75 Million have been subscribed. The other source of finance available to the Bank is through the sale of debentures. Due to high competition in the form of high interest rates paid on deposits by other institutions, the Bank's debentures have to be placed with official institutions that normally subscribe to Government securities. The exigencies of Government finance compel the Government to place limits on the volume of debentures issued by the state Mortgage and Investment Bank. While the bank is by law authorised to accept time deposits, it has not done this upto now. In the present situation of relatively high interest rates, time deposits as a means of finance to the Bank do not seem to be a viable proposition.

The rates of interest charged by the Bank of housing loans vary between 12 and 18 percent per annum depending on the size of the loan, with an upper limit of Rs. 200,000. Repayment of the loan is in equated installments over a period not exceeding 20 years. Loans in excess of Rs. 200,000 carry a rate of interest of 22 percent and a much shorter repayment period of 5 years.

While the outstanding amount of loans granted by the Bank would appear to be relatively small in comparison with the outstanding loans of the Bank of Ceylon or the People's Bank, a closer examination of its lending operations would show that the Bank has been playing a rapidly increasing role in housing finance.

In its first year of operations, the loans granted by the Bank for construction of houses and purchase of houses amounted to Rs. 15.5 Million. The amount rose to Rs. 27.7 Million in 1980 and to Rs. 61.3 million in 1981. Thus in a short space of 3 years the Bank has been able to increase its investment in housing loans fourfold.

The bank also provides finance for other purposes like development of agriculture and redemption of debts under mortgages. But there has been a very distinct shift of emphasis in its lending operations towards housing. In 1979, 56 percent of its total loans was granted for housing purposes, both construction and purchase. In 1980, the proportion rose to 78 percent and in 1981, to 89 percent. The Bank's lending policies also seek to encourage construction of a house rather than purchase. Of the loans granted for housing purposes, 62 percent went to construction in 1979, 75 percent in 1980 and 85 percent in 1981. The average size of its loan in 1981 was Rs. 90,000 which shows that the Bank's lending policies encouraged smaller loans than larger loans.

Recently, the legislation relating to the State Mortgage and Investment Bank was amended to confer on the Bank authority to undertake property development. Under this, the Bank plans to purchase land outside Colombo, provide the infrastructure, block off the land in small parcels and sell them to individual purchasers.

The discussion so far points to a severe shortfall in resources available for housing finance. The ambitious programs of development that are planned for the future would at least mean the maintenance of the present level of government contribution to housing finance. The commercial banks could be induced to lend more of their resources for housing by the Central Bank undertaking to refinance their loans.

This could, however, have inflationary consequences.

The other possibility of expanding activity by the State Mortgage and Investment Bank, by raising funds to the extent necessary to meet demand for loans in full would have the danger of drawing resources away from other priority areas.

There has in the last few years been some discussion in Sri Lanka on the establishment of a new housing bank. As we look at the matter from an overall angle, the problem in housing finance is one of resources and not the lack of inadequacy of institutional arrangements. There is after all a single pool of national resources from which the competing claims of the different sectors of the economy have to be met. Any significant impact on housing finance must come from an enlargement of the resource pool. Establishment of new institutions cannot help very much in a situation of resource constraint such as the one we have in Sri Lanka right now.

In such a situation, resource allocation has to be made on the basis of priorities set by the Government in its development effort. Even market forces appear to have relegated housing to a lower order or priority as seen from the decision of some commercial banks recently to stop the grant of housing loans altogether or to reduce their involvement in this area. Purely as a commercial proposition, there are more profitable avenues of investment in the economy. It would be difficult indeed for a private housing bank to raise resources in today's market conditions at something like 20 or 22 percent, to lend to the housing sector with a reasonable margin of profit. The very large majority of the people in this country cannot afford to raise housing loans at a rate of interest of something like 25 percent, particularly in a situation of very high construction costs. The problem thus is one of the resources and cost of credit, not the inadequacy of institutional arrangements.

As already seen the State Mortgage and Investment Bank has, in the first three years of its operations, 1979-1981, been able to handle a rapidly increasing number of housing loans.

It approved 285 loans in 1979, 366 in 1980 and 681 in 1981. The total amount loaned for housing also rose rapidly, as indicated earlier, from Rs. 15.5 Million in 1979 to Rs. 61.3 Million in 1981. Admittedly there are organizational weaknesses, staffing problems, and delay arising from other causes of a general nature like examination of titles to land, that would confront any institution lending on the security of land. These are matters that can be remedied. But what is clear is that, despite these problems, the State Mortgage and Investment Bank has been able to gear itself in the short period of three years to handle an increasing colume of loan applications. At the end of 1981, the Bank had in hand 2,029 applications without adequate lending resources to back them. The Bank had, therefore, to decide not to advertise its services until the resource position improved.

The solution to the problem of housing finance lies not in the creation of new institutions but in augmenting in whatever way possible the resource base of existing institutions. It was in this spirit that the Government, despite its own serious budgetary difficulties, enabled the State Mortgage and Investment Bank to raise resources by debenture issues on an increasing scale. The bank issued debentures for Rs. 15 Million in 1979, Rs. 10 Million in 1980 and Rs. 60 Million in 1981. For 1982, the Bank has been allowed to raise Rs. 50 Million by debenture issues. The Government's approach, within the overall resource constraint, has been to bring about improvements in housing finance gradually.

A study of housing finance in Sri Lanka was undertaken last year by a team of experts from U.S. A.I.D. We are very grateful to the A.I.D. authorities for organizing and financing this study, which has been very useful to us in crystalizing our thoughts on the subject. The report takes into account the resource constraint and basically argues for more efficient utilization of the available resources.

The study team has come to the conclusion that the most practical solution at present would be for the State Mortgage and Investment Bank to take on a broader role as both a secondary lender and to continue to carry out its functions as a primary lender, including the financing of direct Government programs. It should also begin to assume the powers of a regulatory agency with regard to housing finance in Sri Lanka. As time went on, the bank could increase its role as a regulatory institution and secondary lender and decrease its responsibilities in primary lending if there appeared to be justification for this job. As regards the creation of a new housing finance institution, the report concludes that a decision should be left to private institutions. If private investment does not see an adequate return, then the institution should probably not be created, the report adds.

I am broadly in agreement with the approach suggested by the study team and certain specific recommendations made by the team should also be considered carefully. The Government has already decided to allow the State Mortgage and Investment Bank to play the envisaged role in housing finance. This raises certain important questions that must be resolved if the bank is to play the expanded role expected of it. I think it is vital that we identify these questions at this initial stage itself.

First, the management and staff of the bank need strengthening. It has to grow rapidly from its present commitment level of some Rs. 60 Million in 1981 to a substantially higher figure if it is to provide housing finance in the amounts that are required to catch up with the backlog and also meet the current demand within a reasonable period. This would require the recruitment of adequate number of new staff and training them under a crash program.

Secondly, the Bank's resource base will require substantial expansion. The issued capital of Rs. 75 Million as well as the authorised capital of Rs. 200 Million will have to be reconsidered.

Apart from that, the bank will require a less uncertain source of finance than at present, where the issue of the bank's debentures depends on the residue left in the capital market after Government has met all its requirements for financing its own budget. It is true that in recent years the budget has devoted substantial sums for direct construction of houses. If this activity is now to be taken out of the budget some resources may become available for use by the bank.

A Third point which I wish to raise concerns the cost of housing finance. I have already indicated earlier that there is a substantial subsidy element in the current rates of interest charged for housing loans by the National Housing Development Authority as well as the State Mortgage and Investment Bank. At today's rates of interest in the Sri Lanka market - in which 3 year money is being raised at 16% by Government - Investment in housing tends to be uneconomic, considering also the high costs of building materials and land. While some changes in construction techniques may result in bringing these construction costs down, there still is the problem that a person who borrows money for construction of a house, at say 20%, is called upon to pay 1/5 of the loan in the first year itself as interest alone. While such rates of interest may be in order for traders, they would be too high for industries with a gestation period, and almost prohibitive for housing, especially where a house is for purposes of family living and not for commercial renting. Even in the latter case rents can become excessive in relation to income, except for the highest income groups. Thus some modality for subsidising interest rates for housing finance may be unavoidable but any such scheme would require close supervision to prevent leakage of resources for other purposes.

I have tried to trace in broad outline the institutional framework available in Sri Lanka and to highlight some important questions pertaining to the provision of finance.

Before I conclude I must make the point that the provision of finance is only a necessary condition for increasing the supply of housing but not, by itself, a sufficient condition. There are several other conditions such as the provision of water supply and drainage, an adequate supply of buildable land with good title or a more comprehensive scheme of title insurance more research into appropriate design, techniques of housing construction, and building materials and many others that have to be tackled simultaenously if housing construction is to expand at the desired rate and at nationally tolerable costs.

As such the policy calls for more application of massive technology in the provision of these services and sudden increase of manpower need both for construction and operation maintenance of the services. A major policy item is the further promotion and strengthening of responsibilities of the lower levels of government: provinces and local authorities. This however can only be successfully pursued if sufficient expertise is established at such levels. Another major policy principle which the government of Indonesia has adopted concerns a strategy of strong cooperation between the public and private sectors in order to mobilize all available resources for the nation's development. In the field of training and education this partnership can be observed in two ways: We include our partners in the private sector in our training programs and on the other hand has parts of our training programs carried out by the private sector.

The Ministry has been conducting training programs starting from Repelita I upto the present day specifically in support of the programs it is responsible for. It is however during the present Repelita that some of the training programs have been or are in the process of being expanded greatly in response to the greatly enlarged sectoral programs as well as the mentioned decentralization drive. This expansion specifically concerns the programs of kampong improvement, rural housing, and urban water supply.

It was realised by the development of planners and executors that lack of trained staff formed and would form a major bottle-neck in planning, implementation and operation of the planned facilities. At the same time it was realised by the policy makers that existing institutional framework for training in Indonesia would not be able to respond fast enough to the specific training needs as demanded, both quantitatively and qualitatively. It is therefore necessary to establish in-house capacity within the Ministry for its specific training needs.

Besides setting up its own training courses the Ministry stimulates and sponsors university faculties and other institutions in setting up special and post graduate courses, so reinforcing the general status and capability of such faculties.

Planning for training within the Ministry has so far been determined largely by immediate and emergency needs. Little time could be devoted to formulate comprehensive training models based on elaborate surveys and forecasts. However, the recent past has witnessed efforts to formulate longer term training previews for the major sector development program of the Ministry of Public Works.

In this short paper it will not be attempted to deal with all of the Ministry training exhaustively. Instead it will be limited to the main outlines and methodologies. It should be realised that much of what is going to be presented is still in the midst of development and experience is still rather scanty.

In the following some main issues will be dealt with as follows:-

Paragraph 2 will discuss the felt manpower and training needs and the development of the methodology for assessment.

In Paragraph 3 will give a review of experiences and approaches in the various training programs.

In Paragraph 4 will deal with resources and training facilities.

In Paragraph 5 will discuss the organizational set-up.

In Paragraph 6 will contain a concluding statement on the experiences so far and likely options for the future.

2. FELT MANPOWER AND TRAINING NEEDS

There is a great need in the Ministry to train its own personnel right from the management level to down below at the field and the operation levels. Most of these training needs of the internal personnel are met through training opportunities offered by various training institutions both in Indonesia and abroad. This paper however mainly deals with the felt training needs for local government and other personnel outside the Ministry but who are yet playing key roles in the impelemetation and the "post construction" operation and management stages of the infrastructure built. The broad coverage of training conducted by the Ministry includes amongst others the following target groups:-

1. Planners at the provincial and local government levels.
2. Managers for kampong improvement, housing, water supply and urban sanitation implementation units.
3. Operators and skilled technicians for urban facilities, especially water supply.
4. Consultants for pre-investment studies and project preparation in the field of housing, kampong improvement, water supply and urban sanitation.
5. Contractors, especially small contractors for simple civil works under urban improvement programs.
6. Field Supervisors.
7. Managers to run local water supply enterprises.
8. Field extension workers for kampong improvement and rural housing improvement programs.
9. Popular/community participating groups (non governmental organizations).

Initially Cipta Karya has been conducting training as an immediate action response to these rather overwhelming needs without going into an in-depth study of the manpower requirements. Gradually however, the realisation grew that for the purpose of a more refined planning and resource utilization an analysis of the longer term manpower requirement both in the qualitative and quantitative sense would be needed, as a necessary input for a sound manpower development strategy. It should be remarked that such a manpower development strategy, also called human resource development, should not only concern the training aspects but also personnel policies as a whole (career development, personal benefits, etc.). The first efforts in the manpower need assessment were mainly confined to qualitative aspects (type and level of personnel needed). However of late more and more attention has been given to quantitative aspects too (numbers required).

An illustration of the Ministry endeavour in manpower development planning is the water supply sector where such a long term planning exercise has been carried out in which a number of trends were analysed against various scenarios. It is observed for instance that the water supply program in line with the equity policy of the government will shift its emphasis from the large centers to the medium and small ones, even to semi-urban communities to be provided with basic need of clean water. This shift now leads to the need for a much larger number of dispersed systems, with an entirely different personnel structure. Systems generally require a much higher manpower availability per l/s capacity the smaller they get. At the same time however the required qualifications are generally lower and less specialised. It was further observed that over time much different tasks will come into focus once the initial implementation and operational tasks are covered: focus may then change to the efficient running of water enterprises and organizations, proper water use and health education and community participation.

At the same time other and new organizations and target groups come into focus for training: for example the national boy scout movement with a total membership of more than 8 millions which could actively participate in guarding water quality and spreading the message of proper water use and hygiene to their families, also the women's organizations through their family welfare program (PKK).

Unavoidable is the interaction with other competing sectors which may drain the sector of trained manpower, which originally had been so cautiously planned for.

The conclusion from the above may therefore be that long and longer term planning is needed, however at an indicative level only. Medium and short term planning should be able to respond flexibly and dynamically to factors which as yet cannot be foreseen in their impact.

Last but not least, one important issue in manpower development which deserves our attention is the matter of technology change and choice: the choice of technology indeed largely determines the number and qualifications of people to be employed. For achieving a larger coverage of population with basic need of services, Indonesia has no alternative but to adopt a massive technology which requires also an appropriate planning for manpower development. Especially in a situation of scarce manpower one will try and reduce manpower requirements as much as possible in two aspects: less people and/or lesser qualifications. The first can be achieved through automatization, the second through simplification and manualization. Since Indonesia possess abundant yet low-skilled labor resources, the latter approach is presently favoured.

Meanwhile technological developments are also in full swing, which means that over time more and more innovative, simple and less sophisticated installations can be expected to become available, which are still simple in operation and maintenance. Developments of the sort may revolutionize small surface water treatment supplies into easily maintained and operated units.

3. EXPERIENCE AND APPROACHES

The Ministry of Public Works conducts a broad variety of courses in the field of urban developments. This should be no surprize given its greatly diverse task field and its broad conception of training responsibilities which stretch into the sphere of the local authorities as well as the private consultancy and contracting world. Over time an equally diversified pattern of course set-ups has been developed and envolved both in internal and donor assisted efforts.

In the following a number of approcahes and experiences will be highlighted at the hand of brief descriptions: (For sttistical data on Cipta Karya training may be seen at the appendix 2.)

3.1 Training of housing and kampong improvement planners and managers assisted by Bouwcentrum International Education

In 1978 the Ministry of Public Works signed on agreement to cooperate with Bouwcentrum International Education to undertake a five-year program in training to fill the gap of qualified housing planners and managers. The need for this particular type of training was soon felt by the Government in providing adequate manpower to implement the housing development program. The cooperation with BIE program was implemented taking the form of three workshop sessions for internal Indonesian need, and one regional seminar to serve the need of the neighboring countries of the Asian region, annually. The three workshops cover the subjects relevant for training of housing planners, housing managers and kampong improvement unit staff. Recently another workshop was added to teach the use of aerialphoto interpretation for planning of kampong improvement project.

The need for using recent techniques in aerial photo interpretation is necessitated by the speed and acceleration of provision of basic services as stipulated in the Third Five Year equity policy.

One of the interesting features in this BIE training is the process of recruiting potential domestic lecturers for the program, to ascertain the continuity of the program and the gradual phasing-out of the dependence on external aid: From the participants of the national workshop sessions, three to five participants were selected each year. These three to five candidates were again screened to select one or two who were best qualified for advanced education in Bouwcentrum in the Netherlands. After a more intensive education in Bouwcentrum the pre-selected participants will return and become the core teachers, workshop session leaders, and organizers of the subsequent training programs.

Another aspect of the training program is the role which the government played in the cooperation program. Initially the contribution of the government was limited to recruitment of participants. In the course of implementation there was a gradual transfer of responsibility and role from BIE to the Ministry of PW, such that at the end of the present cooperation project (1982) all the conducting, lecturing, and funding of the program will have been taken over by the government. From then on BIE will only render assistance in the form of specific expatriate lecturers, and bear the cost of participants from outside Indonesia during the regional courses held each year. The cooperation project is now being considered for extension with another emphasis, namely on research of cases and subjects to be used as material in the curriculum.

3.2 Training in low cost housing construction and management techniques in Solo Mojosoongo low cost housing project.

Another more recent project on training was conducted in the framework of Mojosoongo low cost housing project in Solo assisted by technical aid from the Netherlands Government.

According to the terms of reference given a training program for all the personnel who would be involved in the management and construction of the low cost housing project. Through this arrangement, it was expected that a transfer of knowhow, especially in the field of construction management techniques could occur to the local personnel. In implementing the training program, the Ministry of PW having the in-house expertise of the mentioned BIE training for housing managers rendered the training services in cooperation with the consultant.

3.3 Training for Pre-investment Planning and Project Preparation for Water Supply

If in the two examples mentioned above the target group of training were personnel from the housing corporations, and partly local government staff in charge of implementation of housing programs, in another training program. The Ministry is similarly concerned with improving the skills and technical capability of the domestic engineering consultant personnel, especially those specializing in the urban development field. It is recognized that with increase of development activities, the need for consultancy services will also increase, and in the shortage of domestic consultants, the government is forced to use expatriate consultants who are generally more costly.

Considering the limited funds available, it is necessary for the government to promote the number and qualification of the domestic consultants to meet the need for consultancy services. Under a technical cooperation with UNDP and WHO, the Ministry has for example developed a training program in which water supply consultants were trained by a special training consultant. After they had completed a period of classroom sessions, each of the participating consultants were assigned project as an exercise as a part of the training program.

The consultants were still guided by the training consultant in undertaking the preparation of project assigned to them. Through this training program, the government wishes to promote domestic consultants who can also qualify for preparation of projects to be funded by international agencies such as ADB, IBRD etc. It is expected that the resulting project can be offered to donor agencies/countries for implementation funding.

3.4 Training for Kampong Improvement and Rural Housing

Both training programs are carried out by the Ministry of Public Works.

a. Training for KIP (Kampong Improvement Program)

Next to training efforts in the field of KIP as described under 3.1 and which are carried out between the BIE and the Ministry of Public Works, also a number of complementary courses are being carried out.

The Directorate General Cipta Karya basically conducts three types of courses in the field of KIP and other training is conducted by the private research foundation LP3ES:

a.1 The so-called KIP motivator course

Here the high level decision making officials and administrators of Local Authorities and Regional Planning Bodies (BAPPEDA) are informed about the main policy and implementation issues surrounding KIP. As such it is meant to create an awareness of the importance of and an active support for the KIP programs which are planned for their respective cities. These "motivation" sessions have been found to be quite effective in enthusing formerly sceptical and reluctant local authorities.

a.2 Training of KIP consultants

Recently short courses have been initiated to train domestic KIP consultants, particularly in respect of government policy towards KIP as well as the technicalities of project preparation, implementation and supervision. It has been found that this course has contributed to a more uniform quality of project preparation by the consultants.

a.3 Training of government Personnel directly involved in preparing, implementing and supervising KIP

The personnel of the KIP Units, and the Provincial and Kabupaten Public Works officers are trained in the planning implementation level. As it involves large amounts of local personnel, training of this kind has been decentralized to Cipta Karya's regional training centres. These courses have been largely instrumental in creating an initial core of expertise in the local Authorities with KIP projects.

a.4 Training of KIP extension workers

This recently established course was developed by the private Research Foundation LP3ES, an institution with considerable experience in KIP monitoring and evaluation. LP3ES has also been charged with the initial execution of the courses.

This course trains people who can act as community counselors and motivators with the specific assignment to inform people about the socio-economic programs of the government for KIPd areas and to help them in applying for them. These workers are further supposed to be instrumental in forming a liaison between the implementing agencies of "physical KIP" and the population.

Experiences on these courses are still being evaluated.

b. Training for Rural Housing Improvement

This program is an interesting one as it concerns the national program with by far the largest number of project locations: Under the present Repelita 6000 villages should be covered (10% of the total 60,000 villages), as compared to 200 cities for KIP.

In response to the dispersed character of the Rural Housing Improvement program a three level training structure has been organized which "cascades" down to the village level as follows:

b.1 Training of the Trainers in the Rural and Provincial Rural Housing Training courses

These trainers are supposed eventually to act as trainers in the courses b.2. and b.3.

b.2 Training of the Rural Housing Instructors at kabupaten (District) Level

These trainees are expected to train and guide technical personnel in charge of the technical execution and extension work, i.e. the personnel at kecamatan level (Sub-district).

b.3 Training of Rural Housing field implementors

Next to the daily guidance and instructions which they receive from the district (kabupaten) officers trained under b.2., the field implementors at sub-district (kecamatan) level are trained in provincial courses conducted at present in 17 provinces in Indonesia.

b.4 Training of Rural Housing participants in basic home building skills

Lastly three day courses are conducted at village level to teach the participants basic home building skills, s.a. wood work and masonry as an input to their communal self-help contribution.

3.5. UNCRD Approach in Training for Regional Development

Another method of training was demonstrated in a Training cum Research project for regional development carried out with assistance from the United Nations Centre for Regional Development (UNCRD) which is based Nagoya, Japan

Under this UNCRD initiated project two regions were selected: The Bicol region in the Philippines and the Jogjakarta region in Indonesia. In Indonesia the leading counterpart agency was The Directorate of City and Regional Planning of the directorate Central Cipta Karya. The basic set-up of the project was as follows:

UNCRD assigned experts to both projects who together with the counterpart conduct the necessary surveys, studies and planning work for the formulation of a regional plan. In Indonesia the counterparts consisted by 10 professionals from different agencies of the respective provincial government. Throughout this process the necessary steps and routines were evaluated and laid down in annual for regional planning. During the project period various interim meetings were held at the UNCRD head quarters in which representatives of both the Indonesian and Philippine counterpart exchanged views and experiences amongst themselves and with the panel of experts involved. An approach like this resulted in a mixed output:

- a. A contribution to the systematics of regional planning through manual for regional planning.
- b. An exchange of views between two developing regions in the spirit of TCDC (Technical Cooperation between Developing Countries).
- c. A certain number of people trained within an administrative region in an intensive learning by doing and formulation process.
- d. A better understanding and cooperation among the professionals.

3.6. Training in urban and area social development planning in cooperation with UNICEF

Under a technical cooperation with UNICEF, the Ministry has developed a course in which urban and area planning methodology is taught to the participants along with sensitizing them to the social aspects of development planning.

In this course, participants are guided through field exercises in how to practice interdisciplinary team work among professionals who are working in different fields of social development. The course which has been conducted for more than 10 years has accumulated close to 1000 participants, mostly staff of local planning authorities and local setoral departments.

3.7 Support to the Institute of Technology Bandung (ITB)

As mentioned in the introduction of this paper (par. 1) Cipta Karya next to organising in-house training activities also aims at reducing the manpower gap through the reinforcement of the main academic institution in the field of urban development, namely the Institute of Technology Bandung (ITB).

In the case of ITB the individual arrangement is part of an umbrella arrangement called LPPU ITB or Polytechnical Foundation between Public Works and ITB. Courses under LPPU-ITB cover a number of three and a half year courses leading to a bachelor degree (S.I. level). The coordinating agency is the Regional Branch of DIKLT, MPW's Education and Training Centre (see also appendix for DIKLAT's position within MPW). Training under these LPPU-ITB courses are opened to officers who have been in service for more than five years. The study is generally paid for and there is an obligation to continue in government employment for a certain number of years upon completion of the course.

So far Cipta Karya has traditionally sponsored the LPPU-ITB courses for Urban and Regional Planning (planologi) and Sanitary Engineering, and has cooperated with ITB for a Post Bachelor degree program for sanitary engineering.

As a further extension of this cooperation a 5 year agreement has been signed recently between Cipta Karya and ITB to establish a post graduate training leading to a master's degree in Urban and Regional Planning (S.2. level).

3.8 Joint Ventures between foreign and Local Firms

Though not directly an activity of the Ministry it should be mentioned that the formation of joint ventures between foreign and local consultancy firms form an important contribution to the strengthening of domestic consultants capacity. In some instances, for instance in the transmigration program, the Ministry is being consulted by the expatriate consultants who look for competent domestic associates. Such joint ventures are stimulated through conditional entry requirements for expatriate consultancy firms who wish to undertake activities in Indonesia.

These joint ventures are mutually beneficial in that the expatriate firm benefits from the knowledge of local conditions and organization, whereas the Indonesian partner stands to benefit from the know-how of the expatriate organization. Therefore Cipta Karya looks favourably upon and stimulates those ventures where knowledge transfer is indeed actively pursued.

3.9 Package deals which include training elements

Another training arrangement is where the contractor not only carries out the construction works but also is assigned with the responsibility to train an initial core staff to operate and maintain the installation.

Such package arrangement has been applied in the recent massive water supply package plant program where a total of 110 plants is being constructed over a period of two years. In view of the near impossibility of providing this initial manpower requirement it was decided to include this training in the building contract

Another common arrangement is that consultants are hired to both establish the administration and accounting systems for Water Enterprises as well as train an initial administrative core staff.

The above arrangements have been found quite defective in combatting the initial manpower crash need. However the quality of training performed by the contractors has been found to be pretty shallow. The training of administrative and accounting staff by consultants turned out to be pretty good: as a matter of fact some of the material which was developed by them appeared to be suitable for inclusion in the national training programs for such personnel.

3.10 Training for urban Managers

Last but not least some remarks should be devoted to a type of training which as yet has not taken shape but which is considered as very important for local authority and municipal top officials. It should be noted that in the Third Five Year Plan many of the investment programs of the government have been kept unutilized in the sense of not being able to stimulate and promote further investment from the community. Often sufficient and adequate technical and managerial know-how is lacking in the local authorities in question and the institutional arrangement often is not quickly responsive towards the opportunities created by the new investment.

Most of all however the Ministry is confronted with the challenge of promoting public entrepreneurship amongst the local civil servants corps, which could anticipate and timely react to the challenges of its expanding range of public services. Another problem that the Ministry is faced with is the smooth and effective transfer of responsibilities to Local Authorities for the operation and maintenance of facilities the Ministry has constructed.

One of the issues in developing such public entrepreneurship is to generate and collect sufficient revenues to finance its operation and maintenance in the initial stages and once the system has become fully operational to generate and set aside funds for future extension. It has been observed in several instances that once an active management is implemented, public enterprise may run profit instead of losses in a matter of months.

The above problems have been very aptly described in a recent USAID supported study by Dr. Fred Fisher. Cipta Karya hopes that soon a donor agency can be found to jointly set up such a training institute, which next to its training function should also offer a kind of active information service and guidance towards local authority officials on all matters pertaining to urban management and development.

It should be remarked that a major issue under the next Repelita will be to improve the revenue base of the local authorities as otherwise too much of the development budget of the central government will be absorbed by making up for the operational deficits of the continuously growing number of installations which the Local Authorities are reluctant to take over or else by the premature rehabilitation of too quickly run down installations.

3.11 Technical Cooperation among Developing Countries (TCDC) Training programs in the field of housing, building, planning and urban development

It has been mentioned earlier (see 3.1.) that the Ministry has conducted regional urban development courses training participants from the neighboring Asian countries. Arrangement for conducting regional courses has been given increased attention by the government within the TCDC program. Lately, there are increasing number of requests for training opportunities in the field of urban development in Indonesia by other developing countries. In the last five years hundreds of scholars and observers visited the training centre of Cipta Karya. The largest of them came in groups organized by various training program, some others stayed longer for more intensive training (a.o. from Uganda, Tanzania, Bangladesh, Malaysia, Kenya) at the Directorate of Building Research. More recently, several donor agencies have expressed interest to assist in these TCDC training programs. Japan, for example, has cooperated with Cipta Karya in organizing a third country training program in Seismology and Earthquake Engineering in early 1982, which will be continued annually.

3.12 Overseas training programs for urban and regional development with Belgium Cooperation

Beside the above domestic training opportunities, the Ministry of Public Works has also taken the advantage of various training program overseas. In a technical cooperation program with the Belgium Government for instance 9 to 10 participants are sent annually to Belgium for training in various aspects of regional development such as tourism, industrial development etc., the program has continuously been implemented for more than five years and is now being reviewed to be expanded with another cooperation in which domestic and overseas program can be combined leading to full degree of urban/regional planning (BSc. or MSc.)

4. RESOURCES FOR TRAINING

It will be not a surprise that Ministry Training program requires substantial resources in terms of manpower, finance, training aids, physical facilities and time. Training however is considered a highly worthwhile investment which will easily pay for itself in terms of better professional performance, better quality of management, operation and maintenance of the facilities built, better achievement of functional targets etc. Furthermore training in many instances is a necessary condition without which certain facilities could not function at all.

However within the training program there is a continuous discussion of how to carry out the program most economically. For example training courses with large numbers of participants all over the archipel can be more economically conducted when decentralised to either Cipta karya's regional training centres or even at provincial level.

Cipta karya disposes of 5 centrally operated training centres as follows:

at Yogyakarta	operated by the directorate of Housing
Denpasar	operated by the Directorate of City and Regional Planning
Ujung Pandang	- do -
Jakarta	operated by the directorate of Sanitary Engineering
Bandung	operated by the directorate of Building Research.

Although each training centre is primarily used by the Directorate in charge. And occasionally used by other agencies as well, it is in line with cipta Karya policy to encourage mutual use of the facilities. Besides, use is made of the regional DIKLAT facilities and occasionally of the facilities of the other Directorate Generals.

Funds for the training activities are made available under the budgets of the pertaining Directorates. Foreign aid funds are made available in the form of Technical Assistance and Fellowship funds. Present and past cooperation agreement exist(ed) with IBRD, The Netherlands, UNICEF, Belgium, USAID, UNCRD, and Japan and others. Of late a large increase in interest by the multilateral and bilateral donors has been recorded in respect of the entire sector of Human Resource Development, which they now view as an indispensable support program towards the sectors in question. The main focus of donor interest are the KIP, Water Supply and Urban and Regional Planning Sectors thus far.

5. ORGANIZATION FOR TRAINING IN URBAN DEVELOPMENT
THE MINISTRY OF PUBLIC WORKS

The following agencies carry responsibilities or have a coordinating function for the training programs in the field of urban development in the Ministry Public Works.

a. PUSDIKLAT

Within the Ministry of Public Works there is a central coordinating agency called PUSDIKLAT (Centre for Education and Training) which is responsible for all training matters in two ways:

- a.1. The establishment and conduct of in-house staff up-grading courses. These courses range from basic skills like surveying techniques upto general purpose management for top level officials.
- a.2. The coordination of all other training programs within MPW and its directorates General. This category of programs generally concerns those training programs which are open to participants for agencies outside PW. Most of the training programs as described under paragraph 3 fall under this latter category.

Besides its central office PUSDIKLAT has got coordinating divisions within each of the three Directorates General as well as 5 regional training offices. Within PUSDIKLAT the Bidang DIKLAT (Sectorial Training) division within Cipta Karya is responsible for training programs as a.2. and is therefore mainly concerned with the coordination of Cipta Karya's own training programs.

b. Cipta Karya's Directorates

All of Cipta Karya's specialized training courses are generally conducted by the Directorates which carry the responsibility for the sectoral program concerned. Most of these Directorates have developed their physical facilities as already described earlier under para 4.

c. The Directorate of Building Research (DBR)

One such a Directorate of Cipta Karya, namely that of Building Research plays a special role. The basic role which has been assigned to DBR concerns two main categories of training.

c.1 The promotion and conduct of training activities within the framework of TCDC.

c.2 The pioneering of new training programs.

The first responsibility relates to a strong national and international orientation of DBR, which also houses the United Nation Regional Centre for Housing and Human Settlements in the hot humid areas.

The second responsibility relates to the DBR's supposed role as the main research agency within Cipta Karya in support of CK's sectoral programs.

Management Issues

The rapid expansion of the training programs within Cipta Karya requires a regular review of its efficiency and hence its organizational and managerial set-up. An important discussion item is whether all training should be combined under one agency responsible for all aspects of training (planning, implementation, coordination) within Cipta Karya or whether it should continue to be operated by the individual directorates. So far the "dispersed" solution has been found to be the most practical.

6. CONCLUSIONS

Based on the foregoing a couple of main conclusions will be drawn as follows:

- a. Faced with an acute shortage of manpower for both the construction and operational stages and faced with the inability of the existing educational framework to respond quickly and adequately enough to the specific needs of its programs the Ministry of Public Works has developed a number of training programs.
- b. Originally these training programs were formulated in response to an immediate and overwhelming need. No long or longer term planning was therefore appropriate in this stage. However of late more and more attention is being given to the formulation of medium and longer term manpower development strategies for the main sectors of urban development. Given the large number of uncertain variables which surround such planning, strategies become more indicative and global the longer the plan period concerned.
- c. Initially the manpower planning efforts largely concerned an assessment of the required qualities; of its quantitative assessments have been included, however such forecasts are much more subject to uncertain variables.
- d. A major part of the Ministry training program is aimed at reinforcing its partners in development:
 - d.1 The consultants and contractors for the preparation and construction phase.
 - d.2 The personnel which comes in focus when further decentralising preparation and construction tasks to provincial, district and municipal authorities.

- d.3 Local authority and public enterprise personnel for the "after construction" activities for the projects which the Ministry has developed in cooperation with them or on their behalf.
- d.4 Active community participation at all levels of development. Using NGO's (non-governmental organizations) as driving forces (youth organizations, women movements etc.).
- e. The partnership between the Ministry and private and semi-public agencies is also actively pursued through:
 - e.1 The contracting-out of training activities and/or course development to private consultants and foundations.
 - e.2 The strengthening of existing educational institutes through finance, Technical Assistance and guaranteed course participation.
- f. Next to the expansion of the already established training sectors in relation to the corresponding growth in the pertaining sectors, the Ministry has identified an urgent need for training of Urban Management skills to highlevel officials within the receiving districts and Municipalities.

Such skills are though indispensable in creating financially sound local government operations and through that reduction and eventual elimination of unnecessary and unappropriate dependence upon the Central Government's Development budget

- g. Foreign assistance has formed an important contribution to CK's training programs. As a rule such cooperation arrangements are structured to allow a gradual transfer of responsibilities to the counterpart agency and an eventual phasing out. Often however such cooperation projects result in longer term relationships with the original assisting agency in the form of a continued dialogue or occasional advisory activities.

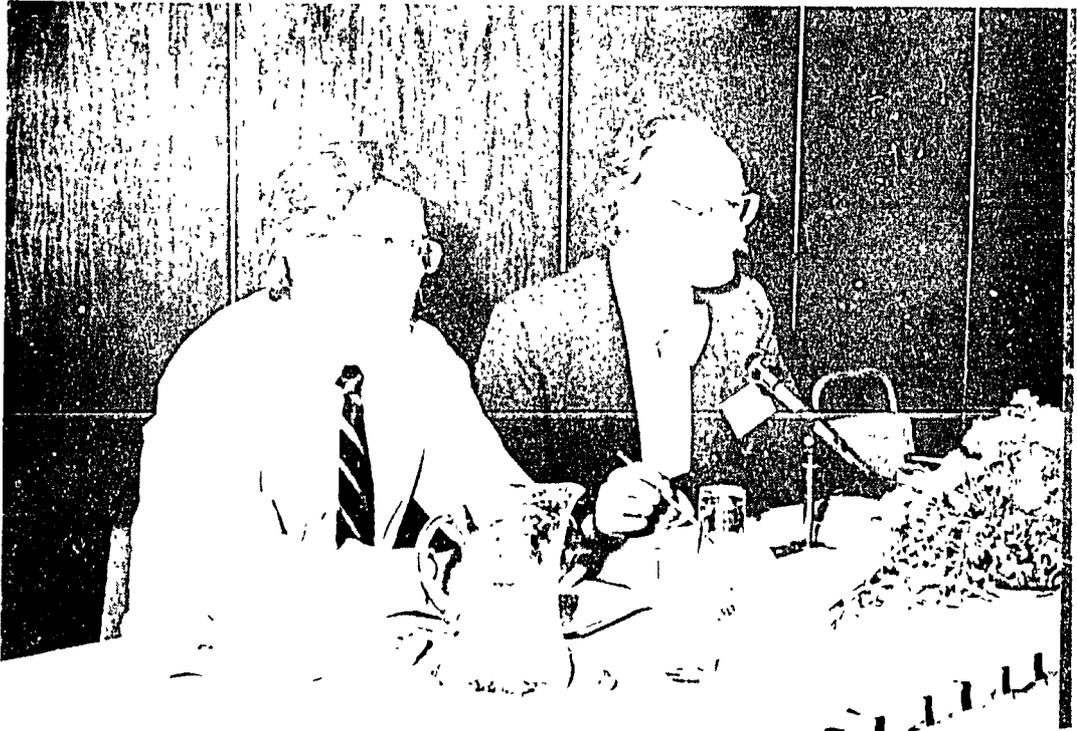
The Ministry welcomes continued participation by donor agencies in the expansion and improvement of this important supporting program.

TRAINING COURSES BY SUBJECT AREA 1982/83 INDONESIA
Organized by the Center of
Education and Training of M W P

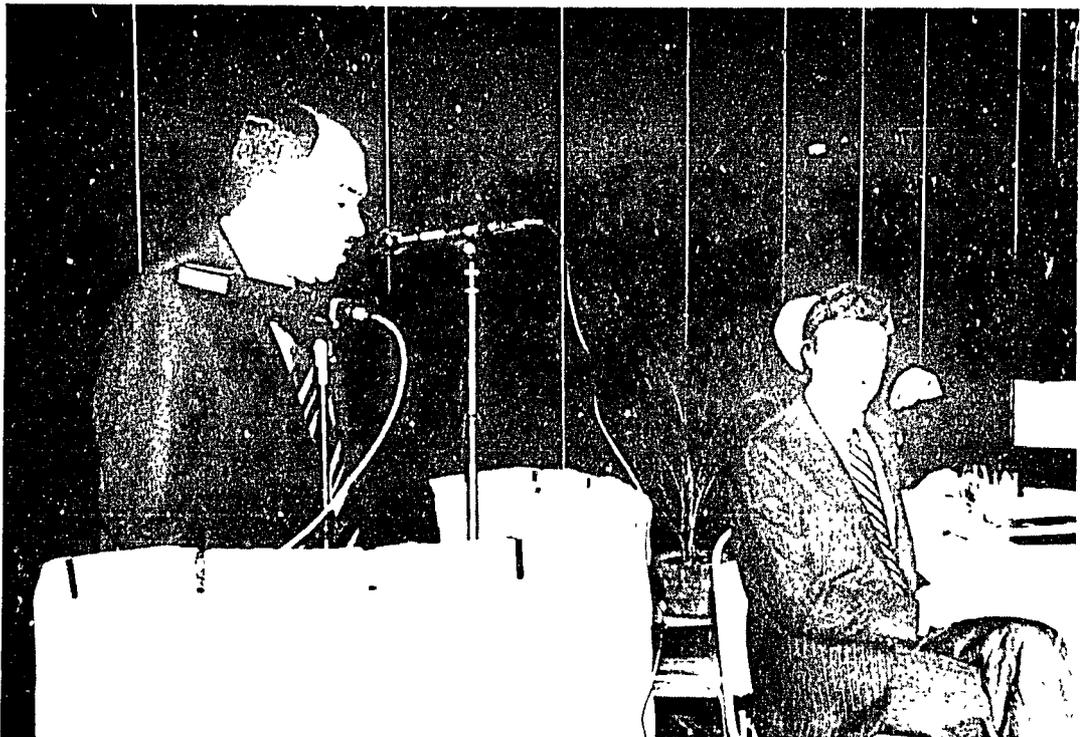
TRAINING CENTERS	A	B	C	D	E
	Management	Finance and Administration	Technical	Other	Total
Sub Total	(15)	(29)	(74)	(36)	(154)
Bidang Diklat					
Tatalksana	7	10	-	9	26
Bidang Diklat					
Bing Marga (Roads & Bridges)	4	3	8	1	16
BD Cipta Karya					
Housing, Building, Planning	24	50	14	10	98
BD Pengairan	3	7	19	3	32
Sub Total	(31)	(60)	(41)	(14)	(146)
GRAND TOTAL	53	99	115	59	326

O. ABBREVIATION EXPLAINED

RAPPEDA	...	Regional Planning Board of the Province
BIE	...	Bouwcentrum International Education
Cipta Karya	...	Directorate General for Housing, Building, Planning and Urban Development, Indonesia.
DBR	...	Directorate of Building Research
IBRD	...	International Bank for Reconstruction and Development
Kabupaten	...	District
Recamatan	...	Sub-District
KIP	...	Kampung Improvement Program
LP3ES	...	Institute for Social and Economic Research, Education and Information
MPW	...	Ministry of Public Works, Indonesia
REPELITA	...	Five Year National Development Plan
PUSDIKLAT	...	Centre for Education and Training, of the MPW
TCDC	...	Technical Cooperation between Developing Countries
UNCRD	...	United Nations Centre for Regional Development
USAID	...	United States Agency for International Development
UNICEF	...	United Nations International Children Emergency Fund
WHO	...	World Health Organisation
Kampung	...	Urban neighborhood of predominantly low income residents



13. Albert N. Votaw, Assistant Director, RHUDO/Bangkok, co-chairs a conference presentation with Mr. D. Parekh, Executive Director, Housing Development Finance Corporation, Bombay



14. Secretary of the Ministry of Local Government Housing & Construction, R. Paskaralingam, Sri Lanka delivers a key Sri Lanka presentation, in the presence of Mr. William P. Schoux, Acting Director, USAID, Sri Lanka.

PLENARY SESSION

ROUND TABLE DISCUSSION ON
PUBLIC-PRIVATE PARTNERSHIPS - WHAT REALLY CAN BE DONE?

This session was chaired by Mr. Claude J.J. Bovet and the panel consisted of Mr. Prayogo Mirhad - President of the Indonesian State Savings Bank, Mr. Robert Maybury of the Australian Association of Permanent Building Societies and Senator Sukunum Thirawat President of the Thai Real Estate Association. Mr. Mirhad and Mr. Thirwat both gave talks which they based on submitted papers, the complete texts of which are given below.

(Follow with Mirhad's and Thirawat's papers)

Mr. Bovet then invited comments or questions from the floor of which a representative few are presented below.

MR. MISTRY:

We in the public sector of the government of India also honestly feel that the public sector should restrict its activities to the objectives of provision of reasonable finance, land, land title and bulk services. One point that has not been mentioned though is the provision of building materials. Building materials have the uncanny habit of vanishing from the market when they are most needed or they go underground and become available to the selected few. The public sector may also have a role to play in the provision of building materials.

With regards to the private sector, the example that has been presented by our Indonesian colleague is a very, very laudable approach. However, I have some reservations. Do the low-cost houses which the private sector provide also have a low price? Because if I understand correctly your government provided the land but the allotment is left up to the private sector. In other words the house which looks low cost can be passed on to a higher price and the balance is given under the table. We are all familiar here in Asia with the parallel economy. This is a pitfall which we must all try to avoid.

Mention was also made of market finance. I've yet to come across an example in the developing countries where the market finance system can work, there are many difficulties.

It all depends on what kind of government you have. In a police or military state things may happen very differently but in a democracy the law takes its own time. It is the legal difficulties which are immense and which might make a market finance system impossible to implement.

As a final comment I would like to put before this conference the question of an Asian Housing Bank. This of course is not an idea of my own creation but I think we should give it some consideration here. What sort of shape can this Asian Housing Bank take? Is it necessary to add other banks which could cover certain parts of the region, especially those parts which share similar problems? Could this bank have contributions for countries outside the region or should we look for finance only from the contributing countries? I leave these thoughts with all of you.

MR. CLAUDE J.J. BOVET:

Let me give you a personal view, I think it is clear to those of you that have followed my presentation of some of the workshops that I don't believe that the Public Sector can solve housing needs by direct action.

It is enlightening for me to see in this conference that there is very little emphasis laid on the construction of houses by govt. The effect that the govt can have is not so much in the financing side or in the construction side but in removing road blocks. I would propose that the first thing that one should address is a housing policy and the first part of that policy relates to land. We have mentioned tenure, that is something very concrete that govt. can address itself to and it's the only one that really can. Another one is the provision of land at reasonable prices. Now land is a commodity that is very much in demand.

It's probably the only commodity that represents real wealth over a period of generations. Land can be hoarded, land can remain fallow, unused because it is a hoard of wealth. So another area of action that govt's can take is to make sure that necessary land is brought into the market because to the extent that land is kept from the market, the little land that is put on will be more expensive, the normal rule of Supply and Demand. How to bring land on to the market?

There are a number of systems. Govt can go ahead and expropriate, pay zero, in which case it is known as confiscation or pay the going revenue appraisals of land, which is to say pay the value of the capital which corresponds to the income that land is making. If it's rural, the price will be low, if it's unused the price will be even lower, certainly below what it's market use might be or, what is preferable in my view, is to bring more land into the market by taxing the inefficient use of it, taxing urban land that is not being brought into the market appropriately and then the owner has the option of paying the taxes and retaining his wealth or seeing what he does with it. The 3rd area which we have mentioned here already is the necessary infrastructure. Now at that point we have land and we have urban facilities or possibly communal facilities as well. Then comes the question of the house itself and I think we should distinguish very much between the 2 extremes that we intend to discuss in the conference. One is minimal shelter, and minimal shelter is one that does not have access to the financial market, at least does not have access without a very definite and deep subsidy. Further up the scale where you have the ability of the future home owner to borrow and service at market rates. At that point I think the Private Sector can attend to him easily where they are dealing with a reasonable credit, where they are dealing with an adequate title and colateral, to where the mortgage stands firm and where the full going rate of the cost of funds to the financial institutions can be translated to the borrower.

In that case it is just a matter of are there enough savings in the country; are they being mobilized properly; is the housing sector competing adequately with other sectors; is foreign finance available and being made use of; can these be improved by additional housing institutions, or housing banks; whether it is national; as it is being discussed here in Sri Lanka or whether it is multinational as Mr. Mistry has just mentioned an Asian Housing Bank? We are really talking about the same thing, we are not creating anything new, we are talking about a new mechanism that is going to compete with the existing ones, but does not address itself to the minimal shelter area that we were discussing before. For the minimal shelter, I feel that the mobilization of resources has to be on yet another level.

It has to be at the level of the users themselves and the community effort within the users and here we have seen that is called the Informal Sector. The Informal Sector is already producing solutions. The Informal Sector is there and when ever it is given a chance it manifests itself. My personal approach to this would be in summary to have the govt. review its housing policies with a view to removing road blocks rather than to creating new institutions, and by freeing the users and the private sector to find a solution. Now if we have in between this minimal shelter and what you might call the normal bank client who can service his debt we have somebody who can acquire credit but cannot pay the full going range of that credit, he does require some assistance. I would say that assistance again could be given to him from governmental resources by way of a subsidy but that the subsidy to the user because of his particular need and that consideration be given to recover this subsidy later on. The inability of a borrower to service his loan which we have been discussing throughout this conference really is an inability in time. It's an inability that is true today, when he is acquiring his home. It may not be true during the life of his debt or later on say 5, 10, 15 years down the road when 2 or 3 things may have happened.

- (1) His income, personal or family will have increased and he is probably in a position to service an increased amortization of his debt, or;
- (2) Through inflation the amount that he is paying off is no longer representative of his debt; and
- (3) The fact tht he has an asset that has appreciated. That he has acquired wealth on the basis of an original subsidy from society, from a govt. from the state and whether this subsidy should now be repaid and made good by him to the benefit of additional citizens in his country. That would be my personal view and I invite some comments and objections to that.

NASSER M MUNJEE:

It is not my intention here to get into a controversy again, speaking again personally I do not agree with your views Mr. Chairman. I think if we take services, urban services particularly, this debate between the public sector and the private sector is not over. There is no debt as to the role of the public sector and private sector. You know I feel a little surprized as to why we should continue with this debate, everybody has a definite role to play especially the basic objective should be equity considerations and efficiency considerations -

- (1) We should try and see that the scarce resources, you have identified them, land, finance, building materials should be efficiently managed and utilised.
- (2) The equity objective of the country should be met and in this case the equity objective should be very clear, i.e: minimal shelter for the poor.

Now to the extent these two objectives can be met, both the public sector and the private sector can play a complimentary role. To quote the example of my country, we have a very efficient private sector - the Housing Development Finance Corporation.

They have come to us for help and we don't shut our doors because it's a private sector. At the same time the public sector plays a very important role with the Housing and Urban Development Corporations. There has been no conflict of interest, there has been no problem and I think basically if we keep in mind the objective, that is equity and efficiency considerations, the whole definition would be automatic. At the moment there are distortions in the economy, there are cost fluctuations, rising rates of interest, high rates of market lands. The government will not have intervene depending on its political objective to bring in some sort of order to the market situation. The point that I wanted to make is that this endless debate between the public sector and the private sector could continue depending on the views, but I think if basically everybody has a role to play as in the case of other urban services, this debate is long over and it is futile to continue again and again with this session.

ROUND TABLE DISCUSSION ON
PUBLIC-PRIVATE PARTNERSHIPS - WHAT REALLY CAN BE DONE?

A PAPER PRESENTED BY:

PRAYOGO MIRHAD
PRESIDENT, THE STATE SAVINGS BANK
INDONESIA

Most governments have identified the important role the private sector can play in the provision of shelter. Therefore, we can ask ourselves the following key questions:

- What has our country done specifically to implement this objective?
 - What can governments do to encourage the private sector to produce more low-income housing?
1. Observations made in 1974 indicate that next to the available housing stock there also exists a significant housing gap. The existing housing stock does not serve as adequate shelter. The greater part even re-found in below-standard residential areas, called "kampong" or slums.
 2. From the afore-mentioned observations the following problems are identified:
 - a. Each year a number of houses must be built to meet or reduce the gap.

The housing gap will always become bigger if nothing is done to overcome it.

3. Alternatives to Overcome the Housing Gap

Alternative I

When it is programed to overcome the housing gap by the year 2000, then there is need to build 12 houses per 1,000 people or 1,500,000 housing units per year. This obviously cannot be implemented.

Alternative II

It employs a stages approach, i.e. to catch up with the housing shortage as a result of the population increase.

- a. The required addition becomes: number of houses/1,000 people/year = 440,000 housing units per year.
- b. An estimate of the social ability to help reduce the shortage by themselves: 2 houses/1,000 people/year = 230,000 housing units per year
- c. The balance of the shortage is expected to be overcome by the society with the stimulus and assistance of the Government: 210,000 housing units/year, consisting of 120,000 units/year in urban areas and 90,000 units in rural areas.

Note:

Building houses does not mean just building the houses only. It also means the building of healthy housing environments and this means the provision of clean water and environmental sanitary facilities which mean a huge investment.

4. From the two alternatives put forward, alternative II is employed in Indonesia. It is implemented along two programs:
 - a. The building of new houses in an effort to catch up with the housing gap.
 - b. The rehabilitation of the existing houses and their environments.
5. The program of building houses in urban areas is implemented based on:
 - a. The disparity of the purchasing power of the urban society.
 - b. The inability to make one program effective for all income groups and, therefore, a program is required based on the principle of differentiation.

6. Policy Pattern of Low-Cost Housing Development

The Government has determined the following criteria for low-cost housing (simple housing):

- a. A floor space between 36 m² and 70 m².
- b. A land area (lot) between 60 m² and 200 m².
- c. The price per square meter should not exceed a certain amount which varies from region to region.

Example:

- | | |
|-----------------|---|
| 1) Jakarta | Rp 63,750/m ² (US \$ 98/m ²) |
| 2) West Java | Rp 60,000/m ² (US \$ 92.50/m ²) |
| 3) Central Java | Rp 60,000/m ² (US \$ 92.50/m ²) |
| 4) Riau | Rp 82,500/m ² (US \$ 127.00/m ²) |

- d. The price ratio between the house and the land should not exceed that of 1:1

The criteria set for low-cost housing (simple housing) is meant for housing which can be built by a private developer. The state owned PERUMNAS (National of smaller sizes, e.g. 15 m²/60 m², 21 m²/90 m² at a price of around 15% per square meter lower than the unit price per square meter of simple housing built by private developers.

The government also set the requirements of those eligible to buy simple housing through loan facilities to own housing from the Bank Tabungan Negara (the State Savings Bank).

The criterias are:

- a. Having a fixed income.
- b. Having a monthly take-home pay of not more than Rp 250,000 (US \$385).

Realizing that meeting the need for simple housing requires the active participation of private developers, the Government has created an atmosphere to encourage private developers to build simple housing through, a.o.

- a. The facilitation and priority of simple housing locations conform to the town planning.
- b. The control of prices of land.
- c. The provision -- within limits of the Government -- of clean water and electricity.
- d. The provision of construction loans at a reasonable interest rate by state banks.
- e. The provision of loans to own housing by state banks (BTN).

7. Procedures of Simple Housing Project Management and Marketing

The implementation of the simple housing project and the marketing are done in an integrated way and in big numbers:

- a. Private developers submit their project proposals to the BTN based on set technical (structural) and financial terms of conditions.
- b. When the project proposal is approved by the BTN, the Bank will then issue a Commitment Letter for the developer involved.
- c. On the basis of the said Commitment Letter, the developer will implement the building under the supervision of the BTN.

- d. While building the houses, the developer will start marketing those houses.
- e. When the houses are finished and they meet the requirements of the BTN, on housing loans, and simultaneously they are given request forms for loans. (Those prospective buyers are also prospective BTN debtors).
- f. When the houses are finished and they meet the requirements of the BTN, then a purchase transaction and a housing loan transaction with the BTN are prepared.

Especially in the case of houses built by the PERUMNAS, the formalities with the BTN are much simpler.

8. The BTN Housing Loan Requirements

- a. Having a fixed income and a monthly take-home pay of not more than Rp.250.000 (US \$385).
- b. Not owning a house yet.
- c. Loan period: 5 to 20 years.
- d. Loan to value: 90% - 95%.
- e. Interest: 5% and 9% per year.

The BTN loanable funds come from the state budget which is specifically allocated for the PERUMNAS Project, whereas funds for the private developer project are made available from the BTN own budget which are accumulated from savings and from the liquid credit of the Bank Indonesia to the amount of 80% with an interest rate of 3% per year.

The position of funds from the state budget and the big liquid credit of the Bank Indonesia are proofs of the sincere efforts of the Indonesian Government to overcome the housing shortage in the country.

9. Achievements

a. Production Results of the ETN from Private Developers

YEARS	UNIT	RUPIAH	US\$ (000.-)
1976	.017	37.500	.058
1977	.543	1,096.570	1.687
1978	1.652	3,479.400	5.353
1979	4.739	11,726.090	18.040
1980	12.223	38,182.984	58.743
1981	19.491	80,502.097	123.849
1982	13.652	65,052.402	100.081
(Juni)			
TOTAL	52.317	200,077.043	307.811

1 USS = Rp.650.-

b. Production Results of the BTN from PERUMNAS

! YEAR !	! PRODUCTION !		! LOAN ON PERUMNAS HOUSING !	
	! UNIT !	! UNIT !	! RUPIAH !	! USS (000.-) !
! 1975 !	! 2.268 !	! - !	! - !	! - !
! 1976 !	! 8.216 !	! - !	! - !	! - !
! 1977 !	! 20.322 !	! - !	! - !	! - !
! 1978 !	! 19.864 !	! - !	! - !	! - !
! 1979 !	! 26.243 !	! 2.891 !	! 5,867.160 !	! 9.026 !
! 1980 !	! 14.700 !	! 6.273 !	! 10,764.760 !	! 16.561 !
! 1981 !	! 10.203 !	! 23.273 !	! 34,389.468 !	! 52.907 !
! 1982 !	! 2.496 !	! 13.484 !	! 17,465.070 !	! 26.869 !
! (Juni) !	! !	! !	! !	! !
! TOTAL !	! 104.312 !	! 45.921 !	! 68,486.458 !	! 105.363 !

1 USS = Rp. 650.-

ROUND-TABLE DISCUSSION ON
PUBLIC-PRIVATE PARTNERSHIPS - WHAT REALLY CAN BE DONE?

PAPER PRESENTED BY:

SENATOR SUKHUM THIRAWAT,
PRESIDENT,
THAI REAL ESTATE ASSOCIATION,
THAILAND

THE PRIVATE SECTOR ASSUMED THE INITIATIVE IN THAILAND. The case of Thailand is unique, in that the private sector has been publicly urging the government since 1975, to take effective measures to provide the low-income with ownership of a piece of land, no matter how small for their family security. With the return to a uni-cameral democracy in early 1975, the government stated for the first time the national policy of constructing 20,000 units of housing per year. The Thai Real Estate Association (T.R.E.A.) commended that positive objective and recommended the necessary supporting measures and stressed that the provision is the key to the success.

T.R.E.A. also specifically requested to know the exact types and numbers of housing that the private sector shall have to contribute, citing the universal examples of the signal roles of housing to be demanded of the private sector to as much as some 90 percent of the total, as in U.S.A., West Germany and Australia. Until recently no definite response was forth coming on this most important point.

SITES AND SERVICES THE MOST SUITABLE. On the subject of the low-income housing, the T.R.E.A. pin-pointed the Sites and Services as the most suitable form for Thailand. Special attributes such as the relatively high degree of self-help that can be mobilized among the low income families, the plentiful lands in the suburbs, all of which have free-hold title deeds and the high rate of appreciation of the property were advanced. It was stressed that the costs of land and housing units in Thailand have been comparatively very much lower across the board than in other countries.

The sooner, therefore, every family could own their family homesites, the better for the national security and personal wealth of the Thai population, at a much less overall cost and effort.

THE EVENTUAL POSITIVE RESPONSE FROM THE GOVERNMENT. In the current national economic and social development Plan for 1982-1986, special stress was made on the vital role of participation by the private sector for the first time. Especially, on housing developments admitting the crucial shortcoming of the National Housing Authority to meet the target during the past five years, every encouragement ostensibly is now being devised to solicit participation by the private sector to the fullest. A national sub-committee on the housing policy was set up with two private trade associations represented; the Life Insurance Association and the Thai Real Estate Association. At the first meeting of the sub-committee, the T.R.E.A. reiterated its readiness and will to help fulfilling the growing needs for housing even for a certain number for the low-income, to the approbation of all concerned.

THE MODUS OPERANDI. According to the terms of reference the Sub-committee on Housing Policy has to submit a working plan to deliver a total of 235,000 units of housing including the backlog for the period 1982-1986. The Sub-committee also is to operate as the clearing house for all joint public-private cooperative projects toward that objective T.R.E.A., being the professional body with its confirmed devotion to the cause of housing the poor, naturally will have to exert its resourceful initiatives to the fullest from now on.

The following are some of the more important measures to be proposed to the government for action.

1. A TRI-PARTITE VENTURE. In Thailand recently there has been a successful attempt at establishing a prototype of self-help housing for the slum families along the basic sites and services format, organised by a dedicated group of knowledgeable citizen call. The Building Together with this association being well aware of the T.R.E.A.'s devotion to housing the low-income, has been requesting for the necessary land contribution for further expansion. Initially therefore a full development of this program will be launched jointly by the Association with its public zeal, expertise and management techniques under the auspices of the public institutions (the National Housing Authority and the Government Housing Bank), on the land to be provided by the private sector. The prospective home-owners carefully screened as before will of course do their best to help themselves.

2. HOUSING COOPERATIVES. Suitable forms of legal housing cooperatives will be set in operation on the lands provided by the private sector with the objectives of catering to the needs of the low-income as well as the middle-income bracket. The main objective is to circumvent all cumbersome and costly existing government regulations, and for the member of the cooperatives to be exempt from all possible costs of excessive taxations, such as the title transfer and stamp tax, the trade tax presently paid by the private business and ultimately to be passed through to the buyers of the housing units, etc. Recently, a sizable income tax on land sales of 3 to 10 per cent of the assessed value was slapped on, thus heavily dissipating the ability of the low-income to own homes. Taking all these savings expressed in the eventual costs to the homeowners the sum total could be quite decisive for the people to help themselves, especially for the low-income.

3. PUBLIC RESPONSIBILITY FOR THE NECESSARY INFRA-STRUCTURES AND SERVICES FOR THE LOW-INCOME HOUSING PROJECTS. With the government ostensible assumption of this costly role for the necessary infrastructure development for the low-income housing projects, the private sector will be able to extend much more of their available lands for the N.H.A. jointly with the G.S.B. to develop suitable forms of housing developments for a broad spectrum of low-income housings. The same practice could be extended to the land parcels suitable for the middle-income living, utilizing the good services of the N.H.A. as the government body to expedite the various services, that hitherto greatly hampered all the private projects and added considerably to the exorbitant burden of the home owners. In sum, this measure aims at the admixture of good business management and resourcefulness of the private sector, with the official stamp and privilege of bureaucracy, to deliver to the low-income and to a lesser degree the lower-middle-income families, the least possible costs. It has been established that the combined need of these two lower-income groups aggregates to as much as 85 percent of total. The overall impact therefore should be profound.
4. ADEQUATE MORTGAGE FINANCING CREDIT MUST BE MADE AVAILABLE TO THE LOW-INCOME EXPEDITIOUSLY. This is a must, and incidentally also the key to easing the extremely tight availability of credit needs for the higher-income group as well. Some of the more important measures to be proposed to improve the efficiency of the existing financial institutions involved in mobilizing the greatest possible housing credits are:

PROPERTY APPRAISAL

- 4.1 Mortgage deeds are the safest instruments for investing in Thailand. Each bank and finance company operate their own system (actually no system) in appraising the property costs, and advance a mere 30 to 50 percent for mortgage financing.

With the appreciation rate more than 15 percent annually, thus in no time the debt/actual cost ratio becomes nominal. There is also no practice of second mortgage. This of course adversely affects the credit worthiness of the home owners selectively to a serious extent. To correct this the proper estate appraisal techniques will duly have to be enforced, as strongly advocated by the T.R.E.A. all along as early as 1975

- 4.2 CENTRAL BANK DISCOUNT ON MORTGAGE FINANCING CREDITS. The mortgage instruments are by far the safest investments financially as afore-mentioned. Therefore, the discount by the central bank for some short-term needs of the commercial banks and finance companies should be in order. This is in line with the presently enlightened priority consensus for the nation to give the fullest possible impetus to the national housing developments, with a colossal target for 1982-1986.
- 4.3 GOVERNMENT GUARANTY OF PERSONAL SAVINGS. The example of U.S.A.'s institutional guaranty of personal savings in the thrift associations such as the Savings and Loan Associations, which currently account for the highest share of the mortgage financing credit, was pointed out to the government as early as 1975.

In early 1982 the Ministry of Finance submitted a draft bill to that effect to the National Assembly, but later on withdrew for further considerations. Through the Subcommittee of Housing Policy, therefore, the T.R.E.A. will give the necessary "push" for the eventual promulgation of this guaranty bill probably in early 1983

- 4.4 INCREASE IN THE SHARE OF PUBLIC SAVING TO HOUSING FINANCE. A recent study on housing finance structures commissioned by the Ministry of Finance, brought out one important figure; i.e. the extent of public saving nationwide registered a spectacular 20 per cent of earning, equal to the fabulous Japanese as compared to a mere 6.5 per cent of the Americans. Yet the share of saving participation in the current housing developments was only 2 per cent. It should be obvious therefore that the government will have to take immediate measures to bring about a much more equitable financing shares for housing from the public saving, especially for the immediate needs to promote the lower income groups which is of the utmost priority. Servicing the mortgage finance of debt so that the family could own their own homes is in actuality a very effective form of captive savings. Add to that the gigantic numbers of the home owners in the low and middle income brackets, and the eventual effect on the nation's economy and social security will be quite phenomenal indeed.
- 4.5 CREATE MORE DYNAMIC BASE TO MOBILIZE HOUSING FINANCE RESOURCES. It has been proposed to the Housing Policy Subcommittee, to set up a form of provident fund for the government servants, the salary for whom presently adds up to as much as 33 per cent of the yearly budget of the government. It is advanced that since 1976 the amount of pension has doubled and the base salary trebled. Therefore, it is logical to set up the pension fund for safe investment in the housing credit.

Such a move would systematically ease the very heavy burden on the future budgetary expense for pension, and at the same time will provide a very good example of mobilizing capital form the institutions, which so far is non existent.

The volume of savings by the government servants and the counterpart contribution from the national budget would add greatly to the available housing development credit.

- 4.6 MOBILIZE FOREIGN CAPITAL AS SEED CAPITAL FOR THE FINANCIAL COMPANIES TO DEVELOP HOUSING CREDITS. The case of the available credit under the Housing Guaranty Program of the Office of Housing and Urban Development, USAID was broached by the Chairman of the Subcommittee on Housing Policy - While the G.H.B. seems to be reluctant on the ultimate cost and the potential spread in utilization, the T.R.E.A. is proposing that the immediate objective is to infuse instantly more credits into the national system. Thus the potential credit could well be "passed-through" to the enterprising credit financing companies at cost, to be fully-secured by property mortgage. In such case the government agency should not concern itself with the traditional "spread" or expendable profit.

5. INAUGURATE THE BACK-UP HOUSING FINANCE INSTITUTIONS AFTER THE EXCELLENT EXAMPLES OF U.S.A. It is proposed that the government set up all suitable forms of supporting institutions to assist the liquidity of finance companies engaged in housing credit. The Federal Home Loan Banks System, the Federal Home Loan Mortgage Corp. (FREDDIE MAE), the Government National Mortgage Association (CINNIE MAE) and the Federal National Mortgage Association (FANNIE MAE) were cited for thorough study.

It is also being pointed out that home mortgage instruments being the safest means of investment, and thus the powerful means of capital mobilization, should be widely made available to the general public for personal investments.

Tying up this form of safe investment with appropriate tax incentives would effect an immediate boost in the housing capital of momentous volume. After all the phenomenal rate of the current 20 per cent saving is already most encouraging, with hitherto no encouragement whatsoever. With the newly enlightened government and willing participation by the rededicated private sector, the Thais could be mobilized to help themselves to own their own homes to the greatest extent.



15. Mr. H.U. Bijlani, HUDCO, India sets forth the Indian experience



16. Ambassador and Mrs. John H. Reed, speaking with Mr. Peter M. Kimm, Director, Office of Housing and Urban Programs, at the Closing Reception.

CLOSING REMARKS

MR. R. PASKARALINGAM,
SECRETARY
MINISTRY OF LOCAL GOVERNMENT, HOUSING AND CONSTRUCTION,
GOVERNMENT OF SRI LANKA

Mr. Peter Kimm, Director of AID's office of Housing;
Mr. William P Schoux, Acting Director of USAID
Colombo; Mr. Albert Votaw, Assistant Director, Office
of Housing, Bangkok, Distinguished Delegates; Ladies
and Gentlemen.

At the very outset, let me reaffirm some of the sentiments I expressed at the inauguration of this Conference on low-income Shelter and Housing Finance on Tuesday morning. I am deeply grateful to USAID for the initiatives taken by them to hold this Conference in Colombo this year. It was a privilege to be associated with the organization of a conference of this stature. It was also extremely relevant, at a time when we re-engaged in the re-examination of our own housing policies and programs of recent years, and it is my opinion that the outcome of the deliberation of this conference, attended by the leading professionals and financial experts of the region, will go a long way in influencing the choice of policy alternatives in our country.

It was also our good fortune to have the Honourable Prime Minister of Sri Lanka to inaugurate this Conference, along with the United States Ambassador and members of the International Diplomatic corps. I consider that this is a reflection of the International as well as local commitment to the need to improve the shelter conditions of low-income households.

I regret that the pressure of work in my office did not permit me to be more closely associated with the deliberations that have been taking place during the last three days.

I have, however, been following very closely the thrust of what has been happening, and I have been very pleased to learn that the outcome of your discussions, and your conclusions and recommendations will be of lasting benefit to the process of housing policy formulation in this country and perhaps for the countries of the region as a whole, most of which are represented here.

One of the major objectives of the conferences was for us to get together to exchange our individual experiences, successes, and innovations in our own countries, and it gives me great satisfaction to learn that the final outcome of the conference has in fact, fulfilled its original promise. The experiences of the Housing Development Finance Corporation of India in the field of Housing Finance, the innovations of India's Housing and Urban Development Corporation in the field of computer-associated shelter design, the wealth of experience of the Indonesians in the field of training, and the commendable performance of Sri Lanka's own housing programs are, no doubt, an inspiration to all of us who researching for relevant and replicable experiences in our own countries.

I am sure you will agree that it is indeed too early to give you an inventory of activities in Sri Lanka which will be influenced by these experiences in the years to come, but based on my work in the field of housing over the last five years in this country, and the experiences of the participating countries that crystallized during the last three days, I have no hesitancy in suggesting that the direction of housing policy in Sri Lanka in the future will most likely involve a re-assessment of the high cost, high subsidy investment activities of the past. The more positive outcome of the conference will be that there would be a greater emphasis on more cost-effective approaches in housing, such as aided self-help and slum and shanty upgrading, during our next planning period. It is most likely that we would also move into more innovative shelter strategies, such as sites and services and core housing, of which we have had little experience so far in this country.

Perhaps the most significant outcome of the conference will be the positive approaches that are likely to emerge in the field of housing finance, through our newly-created housing bank. In order to realize our objectives in these areas, I feel that we also have to re-assess our training needs and re-examine our past approaches to the field of training. I believe that in order to make training useful and productive we need to learn not only from the experiences of other countries but also develop indigenous methods and content.

It is therefore with immense personal satisfaction that I declare that from Sri Lanka's point of view, this conference has been a great success.

It is my sincere hope that those who represent the other countries in the region would share with me in this feeling, from their personal point of view.

I wish in closing, to record my appreciation to all delegates and resource persons who presented papers and participated so enthusiastically in the proceedings. My sincere thanks are due to the USAID officials, and Mr Philip-Michael Gary in particular, for having spared no pains to make this gathering the success that it was. My thanks are also due to the officials of the Sri Lanka Government who collaborated with USAID in the organization of the conference.

I hope you have enjoyed your stay in Sri Lanka, and my sincerest wishes are with you in your endeavours in your respective countries as you work towards the objectives that we all seek.

CLOSING REMARKS

WILLIAM P SCHOUX,
ACTING DIRECTOR,
USAID/SRI LANKA

Secretary Paskralingam, honored delegates and guests. As one reflects over the information exchanges of the last few days, the task of the delegates appears, on the one hand, so enormous as to be intimidating to those of us outside the discipline; and on the other hand, a reaffirmation of the talents that are focussed on the resolution of the world's shelter crisis. Had Ghandi been surrounded by colleagues with your dedication, he might never have composed his famous marching song of "If they won't walk with you, walk alone."

USAID has been pleased and honored to walk the development road with all the countries represented in the room - be it in bilateral or multi-lateral forms. One unquestionable fact is that we are all better served because we are able to share in each other's varied and rich experiences.

At the opening session on Tuesday, Secretary Paskaralingam, Mr Kimm, Ambassador Reed and, of course, Prime Minister Premadasa, laid out the challenge to this conference: To continue your herculean efforts and to do more and do it better. Each speaker and delegte I have heard echoed that call, and the roundtable this afternoon got it to what we often call the "bottom line": What can really be done? I was pleased to note at today's session that many specific, concrete actions were discussed. On behalf of USAID/Sri Lanka and indeed the entire Agency for International Development, I would add that we not overlook the question, what must really be done? The answer you have discussed here is that we simply must bring about a prompt resolution to the crisis of housing our urban and rural poor. We must also develop better systems for those citizens who are, through the developmental process, moving up the economic ladder but who find themselves still unable to secure the decent housing that only long-term financial credits can afford.

We are all aware of the constraints. We are also aware that land and housing are politically and socially explosive issues. In fact, the speaker from Thailand today described that his government treats land tenure in the context of its political objectives. Considering the constraints, we might ask, "Can the task be accomplished, can the crisis be resolved?" A recent study in Central America stated that if the countries under examination increased by one-and-one-half percent the amount of GNP that went into shelter, they could effectively solve the problems by the year 2000. Similar studies in Asia suggest the same general theme may hold true. Such an increase would not be achieved easily and it would, of course, require some reallocation of resources, but it could be done.

USAID believes very deeply that private sector approaches are critical in addressing development problems and are especially relevant to housing and shelter finance. I recognize that saying that to this type of group is a little like telling fishermen you need the oceans. However, I do want to emphasize that we are stressing the involvement and the development of private enterprise in all A.I.D. activities and the housing sector particularly lends itself to this initiative.

I believe the deliberations of this week have been very helpful in a contextual way for those of us in A.I.D. - myself and the A.I.D. representatives from the various countries in the region who are present - for we have gained valuable insights into where we should be and the appropriate roles we can play in this sector in global and regional terms. I am sure I speak for Peter Kimm when I say we will continue this dialogue on a country-by-country basis to identify specific areas in which we might collaborate.

This has been a refreshing experience for me and I certainly hope that you and I can build on the professional and personal relationships formed at this conference. On behalf of USAID/Sri Lanka, we are pleased you came and we hope that what you have learned of the housing programs here in Sri Lanka will prove useful to your efforts in your countries.

THANK YOU.

REMARKS AT CLOSING SESSION OF
PETER KIMM, DIRECTOR,
OFFICE OF HOUSING AND URBAN DEVELOPMENT

First, I would like to thank our hosts for all they have done to make us feel at home and to enjoy our week here. While many people contributed to the effort, a special vote of thanks is due to Secretary Paskaralingham as well as his colleagues and associates.

I want to thank U.S. Ambassador Reed and his staff for all their help and hospitality and the assistance we received from the Embassy staff.

I want to thank my colleagues from USAID who worked long and hard to put the pieces together, especially Al Votaw and Philip Gary.

Finally, I would like to thank all of you for your active participation as speakers, rapporteurs and discussants. Attendance was close to 100% throughout the conference, despite the temptations of this lovely island.

In my opening remarks, I said that I, for one, am an optimist; that I believe that the awesome problems with which we grapple are resolvable, although a great effort is required on a sustained basis.

The work we have done this week has strengthened that optimism. I think the high quality of the Asian leadership present at this meeting is obvious to all. The papers presented and the ensuing discussion show how well the problems have been analyzed, and what significant steps are already being taken to come to grips with the problem.

We have reached consensus on some issues, with almost everyone agreeing on the appropriate course of action. With other issues, there is disagreement. This is as it should be. In my opening remarks I noted that we should take the experience of others and adapt it in accordance with our own culture and priorities. Certainly AID claims no monopoly on wisdom.

I do not mean to minimize the task before us; however, I am very proud to be associated with you, and I know this conference will indeed assist us as we go back home to continue our work.