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# REGIONAL CONSULTATION ON THE CONSTRUCTION INDUSTRY WITH SPECIAL FOCUS ON HOUSING FOR LDCs IN AFRICA

*Theme of Regional Consultation :*

**CHARTING NEW DIRECTIONS FOR HOUSING POLICIES IN AFRICA**

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# CHAPTER 1

## 1.0 CONTEXT OF THIS DOCUMENT

1.0.1 UNIDO proposes to organise a Regional Consultation on the Construction Industry with special focus on Housing for Least Developed Countries in Africa as a follow-up to the First Consultation on the Construction Industry held in Tunis, Tunisia in May 1993. The theme of Regional Consultation is, "Charting new directions for housing policies in Africa" and the Consultation aims at reviewing the implementation of the plan of action for efficient affordable quality shelters in LDCs. The present study aims at analysing the issues and aspects required to be addressed at the Regional Consultation and in its analysis lays emphasis on: (a) the existing policies and programmes of housing in Developing Countries in Africa; (b) the nature of construction industry activities; (c) the need to improve the capacity of domestic building and construction sectors; (d) evaluating policy options to enhance efficiency of shelter programmes and lay groundwork for further action.

1.0.2 This paper has been written to assist UNIDO prepare for the regional consultation on the Construction Industry with special Focus on Housing for Least Developed countries in Africa.

## 1.1 BACKGROUND OF THE STUDY

1.1.1 Inadequate shelter and homelessness are growing plights in most developing countries of Asia-Pacific, African and Latin American regions, and the fast deteriorating living conditions are threatening standards of health, safety and security for majority of population in the low income segments. More people than ever before are living in poverty without adequate shelter and basic physical and social infrastructure. Growing trends of population and urbanisation on one hand and increasing number of refugees, internally displaced persons as a result of man-made disasters in many regions on the other, are aggravating the shelter crisis highlighting the need for policies, programmes and solutions for a sustainable development of shelter sector.

1.1.2 With the greater recognition and wider acceptance of the links between housing production, employment and output, contribution of housing to economic growth and development is explicitly recognised. In this context, the building industry proves to be a key sector of socio-economic development and the construction industry (building and infrastructure) is being increasingly considered as a critical instrument for development. Since the construction industry constitutes a huge economic activity there is growing realisation of its contribution to the Gross Domestic Product (GDP) and the Gross Fixed Capital Formation (GFCF) of a country. As the development continues, construction industry with its beneficial backward and forward linkages with other industrial sectors contributes to the reduction of import dependence in a country provided due emphasis is laid on selection of appropriate construction technology. However, recession and liberalisation trends of domestic markets in some countries during 80s have threatened to halt the rising contribution of construction industry and to erode the role of local construction sector under the impact of increasing foreign competition. This study is mostly based on ideas and concepts which have repeatedly emerged from various international fora during past several years. However, it is interesting to observe how disproportionately little consideration has been given by some planners in addressing the problem of development of construction industry in most countries.

## 1.2 INTRODUCTION

1.2.1 A global appreciation of and concern for shelter issues exists and rests on the fact that no country can claim to have reached the objective of adequate shelter for all its citizens. Most developing countries are particularly struggling to achieve better living conditions in their urban and rural settlements. While there is a growing recognition of important role of better housing in the development process, there a growing evidence that living conditions in many parts of the developing world re actually deteriorating. Unlike in past when housing was seen more as a consumption good and a social sector, today there is a increasing realisation of the need to integrate national shelter policies with macro-economic, social and environmental policies. Consequently greater emphasis is there for evaluating the effect of wider economic policies on the production and cost of housing especially in the developing countries where demographic changes and unprecedented pace of urbanisation have heightened the awareness of both, the problems and the potential associated with the shelter sector. Since 1987, the International Year of Shelter for the Homeless and the subsequent adoption by the UN General Assembly of the Global Strategy for Shelter to the Year 2000, Governments have made a number of fundamental changes in existing approaches to the shelter problem considering specific inter-linkages between macro-economic policies and the efficiency of shelter delivery systems.

1.2.2 In Africa, housing and human settlement issues are linked to various macro factors such as increasing population, rapid urbanisation and its concentration in large cities, decreasing per capita income, displacement of population on account of wars and internal strife, government policies and unfavourable world economic order and trade regime. The level of urbanisation though low (25-27 percent) in Sub-Saharan Africa but the numbers involved are unprecedented and the expected growth in the next thirty years could lead to urban populations of size - 179 million in Nigeria, 58 million in Zaire, 47 million in Tanzania, and 42 million in Kenya ("Cities in the 1990's" edited by Nigel Harris DPU, London). In this region the share of urban population living in cities of half a million or more people grew from 7 to 41 percent in thirty years before 1980. Millions of people in many countries live in unhygienic and overcrowded slums and squatter settlements. The formal system, structured on conventional planning and construction systems, has failed to provide adequate housing, infrastructure and services to a vast segment of the population, especially disadvantaged groups including women headed households. The inadequate access to potable water, sewage and waste disposal has exposed the bulk of the population to a variety of waterborne and infectious diseases.

1.2.3 The Sub Saharan African population of 450 million in 1990 was doubled in 1995, and is projected to reach 1.1 billion by the year 2015. By the year 2000, there will be over 20 cities with population exceeding 1 million. By the year 2020, the urban population is projected to grow to 765 million, with over 50% of the population in cities. The tremendous demographic growth is being accompanied by massive pressures for migration (mostly to expanding urban centres), and higher rates of entries into the labour force in the face of stagnant employment opportunities. A major problem, confronting the implementation of sustained shelter programmes in a number of African countries, is the threat to their continuity caused by political instability and frequent *coups d'etat*, displacement caused by civil struggle, corruption, and a number of other problems of post-independence transition of colonial economies.

1.2.4 Since Habitat I: United Nations Conference on Human Settlements emphasis has been laid at all UN fora, on the fact that construction activity in itself can play a crucial role in the development programmes of shelter, infrastructure and services. Additional

emphasis has since been laid by UN agencies in assisting Governments in the development of policies, programmes, financial mechanisms and institutions to accelerate the provision of adequate shelter, infrastructure and services with particular emphasis on lower-income settlements in urban and rural areas and to facilitate introduction of appropriate building materials through development of innovative technologies and improving capacity of domestic construction industry.

1.2.5 Recognising the widening gap between housing supply and demand as a major problem the programme of work and priorities of the Economic Commission for Africa in this area, is also directed towards (a) strengthening of the indigenous construction sector through transfer of appropriate technology, the development of indigenous skills and (b) establishment of commercial small scale production units of selected local building materials which will have direct beneficial impact on housing for rural population and the urban poor. The approach to the future development of building materials and construction sector as spelled out in the Lagos Plan of Action for Africa's Economic Development, 1980-2000, and in the United Nations New Agenda for the Development of Africa in the 1990's aims at helping the poorer sections of community to build structurally durable and functionally adequate houses at a cost they will be able to bear.

## 1.3 REVIEW OF SHELTER PROGRAMMES AND THEIR EFFECTIVENESS IN ADDRESSING THE HOUSING NEEDS IN AFRICAN REGION

1.3.0.1 In a number of countries in Africa, the national governments have adopted Housing Policies that embody in explicit terms the concepts and strategies of the enabling approach, although the balance of actions in different areas varies considerably from country to country, given the tremendous differences in resource endowments, and perceptions of shelter needs. The observed failure is widespread and systematic movement towards the goals of the strategy has to be seen against the weaknesses of previous shelter programmes, and the inhibiting features of the present framework governing the sector.

1.3.0.2 It is generally true of the African countries that, prior to the GSS, the general record of official housing policies and programmes has been disappointing. Not surprisingly, many of these inadequacies have been carried over into the initial years of the GSS. The record even now is one of isolated successes, against a background of neglect of the shelter sector. The poor people, meanwhile, have continued to seek their own shelter with their own devices as before.

1.3.0.3 In order to chart out new directions in national shelter policies and programmes it is useful to highlight the major weaknesses of past shelter programmes and activities in addressing the needs of the low income groups. These include:

1.3.1 **Misdirected Efforts:** Although the age of large scale public sector investment in housing production is now over, the governments have in the past been concerned mainly with financing the construction of houses (by their agencies or by organised builders) with scarce budgetary funds, and not much with creating an enabling climate for individual construction of houses through the provision of land, finance, building materials and other inputs, and by the creation of necessary regulatory framework. Evidence from country case studies shows that governments do increasingly recognise the links between housing and wider economy but there is a long way to go before this process is realised in national plans. In Nigeria, for example, housing was seen as a social sector until the Third National Development Plan (1975-80) (Odimuko, 1990).

Since then there has been a gradual shift in attitudes culminating in the draft National Housing Policy of 1990.

1.3.2 **Fragmented responses and unresponsive governments:** There has been little effort before GSS, to evolve a coordinated shelter strategy, encompassing different shelter elements and related official and formal sector agencies on the one hand, and the widest participation of different actors in the sector and the people on the other. The beneficiaries are excluded from policy making and project execution, and responsibility for different aspects of shelter delivery are divided, often among a complex set of official and semi-official agencies. Coordination between housing, finance, employment, spatial planning and infrastructure provision, social services, and local administration is vital. The role of decentralised government, community participation and strong municipal government has yet to be recognised fully in the national policies. This is evident from the fact that too many local governments in the region are fragmented, confused about their functions, and are periodically stripped of their functions, and then revived.

1.3.3 **Inefficient use of scarce resources:** The resources available for housing are typically low, not exceeding 2% of the government expenditure of GNP. Even these funds are misallocated in many countries in the form of subsidies to land, services and housing among people like government employees and affluent groups who can afford to pay the market price. The systems of determining eligibility for subsidised sites under the public housing projects, or the methods of implementing these projects and the poor cost recovery, make such subsidised investments non-replicable, and dries up the funds for reaching the poorest families. The standards and affordability criteria were too high, the projects suffered from administrative weaknesses and delays, and the sites allotted to the poor were later raided by the better off.

1.3.4 **Lack of access to the poorest families:** As a corollary to the above, bulk of public investments, and formal sector housing loans, have reached the higher income groups, and the problems of exclusion of the poor and the informal sector from access to housing inputs and public assistance have not been tackled in most countries. This is due to high and inappropriate eligibility criteria, emphasis on clear title to land, failure to address the need for cheap rental housing, ambivalent approach to squatters, rigid practices of formal financial and service institutions, inhibitive building regulations etc., The rising costs of shelter and land, and the scarcity of affordable rental or ownership accommodation, drives the poor to city peripheries, and obliged to commute long distances to work, or face the threat of eviction from vulnerable settlements. The national governments in the sixties periodically launched slum clearance and eviction campaigns, but to no avail.

1.3.5 **Inadequate scale:** As illustrated in *Annexure-1*, there have been many successful experiments in the region to address the shelter needs of the poor, especially in terms of community action, the role of NGO's in shelter delivery, service provision, legal framework and institutional development. However, these successes have been on a small scale, and serve as isolated fragmented cases. These are inadequate in relation to the huge size of the shelter problem, nor these reflect the policy commitment to the innovative approaches in a sustainable manner. For example, the programmes of the National Sites and Service, Infrastructure Development, and Slum Upgrading Programmes in Nigeria are on a very small scale, the latter covering less than 70,000 households till 1990. The general record of the region in the field of land and housing finance is much less impressive than in the areas of slum upgrading and community action. Scaling up the best practices is one of the most urgent priorities for realising the

goals of shelter for all in the countries of the region.

1.3.6 **Role of Construction in Housing:** Virtually, all additions to the housing stock are through incremental efforts of the poor people in producing and improving their housing, though much of this is not sanctified by official construction codes and building bylaws. In rural areas, houses are built by using traditional local materials by people themselves. In the urban sector, about 20% of the output is in the formal sector by public agencies and private builders, using industrialised materials, bulk of which are imported. The high import content in construction in general tends to push up the prices of materials, and renders the unit costs of public housing high, private housing unaffordable to many. The increasing dependence on systems building and instant packaged houses with their imported technology, and the dependence on imported machinery, is biased in favour of capital intensive techniques and renders the available unskilled manpower redundant. The high (western oriented ) standards makes the houses too expensive even with a subsidy for most households, and often ill suited to the local climate.As in the case of other developing countries, mass public housing, based on standardised units, industrial methods, and government administered, are both expensive and inappropriate for most families. Less attention was given to stimulate people to build and improve their houses, to ensure that building materials are available at reasonable prices, and to see that regulations and shelter design facilitate the use of low cost appropriate and indigenous materials by local artisans. The potential for house construction and building materials in promoting larger employment of local labour and in upgrading their skills and incomes was appreciated only recently. The wider dimension of construction to subsume infrastructure also came later.

1.3.7 **Town Planning and Land use Policies**: The legal and regulatory framework governing shelter, and the laws relating to town planning and land use/title, are outmoded, inflexible,and inappropriate, based on norms inherited from the colonial era in most countries, or on the recommendations of expatriate consultants. They are unsuited to local conditions, and militate against flexible and cost effective construction by the poor. Nor are the conventional master plans susceptible to meaningful action or strategic plans for achieving immediate priorities. The plans are divorced from infrastructural plans prepared by sectoral agencies. The plan preparation is time consuming, and once prepared, the plans are not revised frequently to respond to dynamic realities of economic growth and socioeconomic changes.

1.3.7.1 The rigid segregation of land use activities, especially in far flung cities, increases the distance between residential areas and employment centres, and oblige the poor families to spend unwarranted time and cost in journeys to work. This adversely affects petty traders, itinerant women food-sellers and the low paid employees to cover long distances, often by foot, in the absence of cheap and efficient public transport. Secondly, the segregation of land use discourages activities of the informal sector in residential areas, or home based employment for the poor. The zoning system compounds the task of crime prevention in both business districts and residential areas, as seen from the crime records in many African cities.

1.3.7.2 In Nigeria, for example, the basic Town and Country Planning Ordinance, in force till recently, dated back to 1946, and the building codes were based on codes developed by the British in the context of U.K. It was estimated that only 20 to 40% of physical development in major urban areas was regulated by the Government, and the rest was under varying forms of unregulated development in Lagos. Popular participation in planning is infrequent and inadequate. Planning procedures are cumbersome, and are

not so harmful precisely because they can be circumvented by a process of negotiation with the bureaucracy. There was an overemphasis by town planning departments on major urban centres to the exclusion of rural areas. The planners were far removed from the socioeconomic realities and the implementation process. Much of the development investment reflected the bias of policy-makers and consultants, rather than the felt needs of the people in the city. There was overbuilding of roads, but little effort to improve public transport. In fact, lot of public housing was demolished to build the roads. There was no effort to instal,till recently, a metropolitan level authority to coordinate investment priorities and actions of different agencies in Lagos. There were frequent conflicts between federal,state and local governments over land use and areas of authority. The other urban areas are characterised by haphazard planning and urban sprawl, with inadequate basic services. Local governments are not involving in plan formulation, eliciting popular support, or in implementation of major local projects. The position is similar in a number of other countries in the region, and some of them are yet to devise meaningful land use plans.

1.3.7.3 The norms derived from the **planning standards** of ex-colonial powers have contributed to the inefficient allocation of land for different uses. They tend to emphasise physical rather than economic criteria and fail to recognise that low income builders require flexibility rather than standardisation in shelter process. The required minimum standards for building plot services such as access roads, water and sanitation, stipulated in the planning laws are unsuited to local conditions, and unattainable by most residential developers. The wide pavements, the large access roads, and parking requirements are unrelated to the income levels of the residents. The prescription of conventional waste disposal systems ignores the scope for decentralised and low cost sanitation options, and raises the cost of development. The building plot sizes and layout provide large open spaces, a large minimum plot size (often 150 sq.m. for low income areas and 1000 sq.m. for other areas), low maximum building heights, low floor space index (less than 1), and large setbacks. These stipulations favour a sparsely spread settlement with large vacant spaces, low residential density, and increased cost of service extensions. This is aggravated by the provision for large green belts around and within the city. The standards do not permit alternate approaches to neighbourhood design, and steps to devise efficient layouts on the lines advocated in the World Bank Bertaud model. The standards also do not make allowances for the special needs of women, who are often discriminated against by inflexible planning norms. The scope for rental housing in plotted layouts is often ignored, although this is a popular way of augmenting incomes for the poor and provides cheap accommodation for new entrants to the city.

1.3.8 **Building/housing standards and materials**: Housing standards and materials employed for housing construction are too elitist and unrealistic, and contain a bias in favour of imported materials as opposed to local materials. In Zimbabwe, the minimum standard provided for a four room permanent house which was attainable at current costs only by a very few. Quality rather than affordable scale of the house is at the heart of most standards. The building standards often reject the use of more readily available building materials such as the unrolled tin cans, old corrugated iron sheets, recycled wooden components, mud blocks and such other local materials etc., in favour of imported materials like reinforced concrete, steel and glass. It takes years of persistent efforts by professionals to get appropriate alternative materials included in the standards. The prescription of industrialised materials discourages labour intensive construction and the generation of forward and backward employment and skill linkages from construction.

1.3.8.1 It is seen that the present bias of construction practices and use of building materials, and the discouragement to alternate and local low cost materials, derives from the present elitist building standards and bylaws in a number of countries. It has led to unwarranted increase in shelter costs, and has driven the poor to seek shelter in unregulated layouts on the city periphery, or rental accommodation in crowded inner city dwellings, and to commute long distances for work or employment. The high standards of infrastructure raises the cost of development and rules out decentralised management of services in neighbourhood layouts designed in response to community needs and affordability. The situation warrants, as has been recognised in a number of countries and as concluded in a recent UNCHS seminar on Master Plans, mixed land uses and flexible zoning, smaller and economically more feasible plot sizes and flexibility in building layout, rationality in building plot servicing, and lower, more attainable standards of housing units in tune with socioeconomic realities. This calls for greater dialogue between the agencies in charge of prescription of planning and building standards, as well as tender specifications for construction, and the departments in charge of human settlements, so that the standards conduce to the reduction of housing deficits, and not add to them.

1.3.9 **Structure of Construction Industry**: Though increasingly recognised as a key sector in realisation of economic goals and better living conditions it is generally not considered as a clearly identifiable industry in most African countries as also in many countries of Asia and Latin America. As an industrial sector it has been ignored by major actors i.e. economists, planners, administrators and others concerned with development issues. The building materials industry which accounts for 50 to 70 per cent of the inputs for construction industry also functions in a disjointed manner in most African countries. In many countries Governments in past have taken on an entrepreneurial role through state manufacturing enterprises and have relied on centralised production and distribution to meet the country wide demand for basic building materials. For a variety of reasons, most of these production facilities failed to take advantage of the economies of the scale and with gross under utilisation of installed capacity, these were turned into a major drag on the exchequer soon after their commissioning. The under utilisation of installed capacity was mainly due to the uncertainty of the volatile market, frequent break-downs because of poor maintenance, lack of availability of spare parts, inadequate training to maintain the imported machines, high distribution cost and the general inefficiency of state enterprises.

1.3.9.1 In most African countries, the building materials industry for the above reasons, has not only failed to cope with the rising demand but the gap between the demand for materials and domestic capacity for production has widened further, in the recent years. This gave rise to increased import dependence in many countries of the region with attendant pressure on prices as well as on the scarce foreign exchange. However, the state of affairs with respect to technologies relating to shelter delivery may be put into proper perspective by considering the nature and pace of the technological development of the construction industry of a typical developing country in the region. Owing to the wide range of constructed goods required by the developing countries to meet their developmental need, a variety of technologies are used in each of these countries.

1.3.9.2 Three tiers of technology can be found in any of the developing country in African region as is also common of developing countries in other developing regions of Asia and Latin America. These can be categorised as Traditional, Conventional and Advanced.

*i) Traditional*

Traditional techniques are used, mainly in the rural areas, but also in the "unauthorised" settlements around the urban centres, to construct (mainly) dwelling units. The trend everywhere seems to be a movement away from the traditional materials and towards the "modern" varieties (Abrams, 1964; Chemillier, 1988). Many writers have discussed the factors contributing to this trend: changing political, economic and social conditions relating to the process of "modernisation" which influence user preferences, and inflexible bye-laws. Changes in culture and lifestyles have caused, and/or accompanied, this trend, and have led to the demise of traditional houseforms.

*ii) Conventional technology*

A variety of technologies adopted from industrialised countries, involving the use of various levels of mechanisation and "conventional" materials and components, most of which are imported, and are utilised mainly by local contracting firms in both the formal and informal sectors, on medium-sized and small buildings and works for both public- and private-sector clients, mainly in the urban areas, but also increasingly, in the rural areas. The demand for works involving the technologies in this category is of a continuous nature: such projects constitute the bulk of the construction work undertaken in the developing countries each year. The designs for such works are undertaken locally but the techniques and materials they involve are foreign.

*iii) Advanced technology*

Sophisticated techniques are used, mainly by foreign-owned construction companies, on large, specialised and complex, mainly public, projects such as airports, harbours, high-rise office blocks and hotels, factories, dams, irrigation systems and highways. The projects involved are mainly one-time and infrequent. In local construction enterprises in this sector, utilisation rates for expensive imported plant and equipment are seldom the optimum. This is due not only to the discontinuities in operations referred to above, but also, to a variety of factors including: (a) shortage of skilled operators and mechanics, which makes the use of the equipment expensive and inefficient; (b) inability to plan properly for the use of capital items owing to intermittent shortages of other construction inputs; (c) shortage of spare parts, and on occasion, fuel, which leads to the low level of utilisation of plant and equipment; and (d) where foreign contractors are involved, the equipment has to be disposed of on completion of the project.

Thus it is to be seen from the above that shelter programmes and related activities in most African countries particularly in least developed ones in the region, have been often misdirected inefficient, inaccessible to low-income groups and the poor, inadequate and fragmented. Progress in other key areas such as land, housing finance and technology development and application have also been much less impressive.

## CHAPTER 2

## STRUCTURE AND FUNCTIONS OF THE CONSTRUCTION INDUSTRY WITH FOCUS ON HOUSING IN DEVELOPING COUNTRIES

Provision of infrastructure and services, together with housing, is the key to future development. Yet, the low level of investment in the construction sector and the dependence of many countries, including those in the African Region, on imported technology and building materials have increased the unit cost of development. Promotion of the construction and building materials sector is an integral part of the global strategy for self-reliant and self-sustaining development.

Purpose of this chapter is to analyse the different aspects of the construction industry and particularly its relationship and role in the economic and socio--economic activity of a country and contribution that the industry can make in the endogenous development particularly in enhancing housing delivery in a developing situation.

### 2.0 Construction Industry and Economic Development

2.0.1 Construction industry differs from most other industries in several ways. First the construction industry's relative activity is large, accounting for 3% to 7% for Gross Domestic Product (GDP) in most developing countries and upto 9% in industrialised countries. Secondly it absorbs almost 40 to 50 percent of the public sector outlays and generates more incremental value added per unit of investment than any other industry. As such this industry contributes to a substantial percentage of Gross Fixed Capital Formation (GFCF) of a country besides providing employment opportunities. As per HABITAT document `The Construction Industry in Developing Countries' Vol. I, 1984 GFCF ranged from 35% to 81% for ten developing countries. Construction plays a key role in the national economy through its multiplier effects on other economic sectors. Its backward and forward linkages with other industrial activities induce growth and promote industrialisation, backward linkages representing products and services as inputs to the construction sector and forward linkages being the consumption resulting from construction. Thus remarkably dominant role of the construction sector in capital formation has to be borne in mind in policy making for development of different socio-economic sectors including housing and human settlements.

2.0.2 In economical terms, the industry transforms financial and material resources into physical assets such as roads, industrial plants, housing, buildings and general infrastructure. Creation of fiscal assets to enable economic activities to take place is the key aspect of the construction industry. The market for construction sector's enterprises is largely determined by the level of investments. In the shelter sector construction activities also suggest that they are basically a reflection of the needs of the population rather than strictly related to the growth of economy. In general the needs for housing and infrastructure works increase with the population growth. The urbanisation and growth in most of the major cities in the developing countries of Africa creates additional demand for infrastructure, housing and social buildings. In the coming years new shelters will have to be built on a large scale in order to accommodate projected growth by the year 2000 when the total population is expected to exceed six billion, more than two thirds of which will be concentrated in the developing countries. Since construction provides the direct means for the development, expansion, improvement and preservation through maintenance of

housing and human settlements, sustained output of the construction industry is, therefore, vital to the achievement of national socio-economic development goals.

2.0.3 Growth and development of construction industry depends, amongst other factors like finance, land and infrastructure and on the continued availability of resource inputs like building materials, tools, energy, skills etc. It is in this context that the developing countries are required to accord high priority to augmenting the construction resources involving use of indigenous materials and methods. This may involve policy formulation or policy adjustment in several areas and it may involve the establishment of new institutions or strengthening of existing ones and may thus involve the allocation of additional resources in these areas. Nevertheless, a poorly organised domestic construction industry in majority of developing countries and more particularly in least developed countries of Asia and Africa are not in a position to cope satisfactorily with increasing demand.

## 2.1 Nature of Construction Sector

2.1.1 Activities of Construction sector cut across and impact various economic and social sectors through their forward and backward linkages. Building materials, construction methods and technologies, manpower, skills and tools are basic constituents of construction industry. In the context of shelter, obvious target of the industry is to provide shelter, infrastructure and similar output. Shelter as an area in most countries of Africa, particularly in the least developed ones, is encumbered by problems of affordability, availability, durability, habitability and vulnerability in relation to the pertinent building materials and construction techniques. The construction sector in most developing countries in Africa is, however, plagued by low levels of productivity and quality problems, which in large measure, can be traced to a shortage of appropriate managerial and technical skills as well as lack of support structures for the sector.

2.1.2 As emphasised in the Global Shelter Strategy the goal of strengthening construction industry for shelter delivery can be self-defeating if it is met in uneconomical ways, as is currently happening in most cases. This essentially requires choosing those correct technologies and methods which are consistent with the resource endowments of a country, and that construction industry development is sustainable in economic and ecological terms. The basic physical resources for a housing programme include (a) land (with security of tenure), (b) basic infrastructure (water supply, sanitation etc), and (c) the building materials including appropriate technology of construction. A shortfall in the supply of any of these three physical resources will normally result in bottlenecks in the production of housing units. This study in the context of its framework focuses predominantly on construction resources which include materials, techniques of construction and skills required to produce affordable and durable shelter and infrastructure in various situations obtaining in developing countries of African region.

2.1.3 Building materials industry though an industry in its own right has close links with construction industry through materials, designs, systems assembly, production and delivery systems. As building materials account for about 50 to 60 percent of basic inputs to the construction, there is a tendency, and rightly so, to consider the construction and building materials as basically part of the same industry. The Global Shelter Strategy also recognises building materials as one of the key physical resources in the production and improvement of shelter. It has been widely recognised that inadequate supply of affordable building materials is one of the principal constraints in developing countries to provide adequate housing particularly for the low-

income segments of population. Production trends, import trends and rise in prices are three critical indicators particularly affecting availability of building materials at affordable price-which adversely hampers capacity of construction industry to support growth and rising demand of housing. Available data suggest that building materials production and consumption in developing countries, as a whole, increased during 1980s. However, production gains have been highly uneven with major gains registered in West Asian countries and in newly industrialising countries of East Asia. The share of developing countries in the world production of building materials was a meagre 16.7 percent in 1985 and the share of Sub-Saharan Africa actually declined from 1.2 percent to 1.1 percent between 1975 and 1985. In the production of bricks, concrete blocks and tiles figures from Africa and Latin America are lower in 1989 than they were in 1980.

2.1.4 The widening gap between total construction needs and the domestic building materials production capacity in many countries in the African and Asian regions has inevitably led to increased import dependence. During 1975 and 1985 total value of imports of building materials increased, by 36 percent and 58 percent for Sub-Saharan Africa and South East Asia respectively. Available country data on imports of building materials during 1985 and 1989 indicate that imports were not restricted only to processed materials like cement or steel sheets, but covered as well such minimally processed materials as sand, stone and gravel.

2.1.5 Yet another indicator for poor availability of building materials is represented by the price changes of these materials overtime in relation to the average cost of living. Data from Africa show drastic rise in prices of building materials, outpacing the general inflationary trends in the economy. In Tanzania, for example, three basic building materials - sand, cement and steel increased in price more than fivefold during 1982 to 1989 - substantially more than the increase in cost of living index. Similarly recent data from Nigeria show that components of reinforced concrete work, steel roofing sheets and timber doors have increased in price by more than twice the consumer price index during last decade.

2.1.6 The wide-spread shortfall in building materials availability in most African countries and import dependence lead to rising prices which obviously deprive the domestic construction industry in enabling the provision of housing that is affordable to majority of low-income population. In Ghana, for example, it has been estimated that only the richest 30 percent of the population can afford a basic one-room dwelling unit costing $6800, assuming that they could obtain a 25 year mortgage at the 1993 rate of interest. The following paragraphs present the analysis of various constituents of construction industry which have a direct bearing on the shelter delivery.

## 2.2 Construction Industry and Policy Environment

2.2.1 Construction industry being an integral part of a country's economy provides its output through a diversity of engineering works necessary for economic development. Government policies set the economic environment in which the construction industry operates. In the area of housing and human settlements also, the settlements have to be built, maintained and renovated by construction industry. Given the main concerns of governments in the developing countries relates development to expanding production, creating employment opportunities and generating economic growth and providing housing to people, policy environment should emphasize the contributions which can be made to achievement of the goals of shelter for all. The overall national policies should spell out explicitly the link between each sectoral policy

and the national benefit to be gained from the resource inputs and the institutional restructuring involved. Under this concept of a policy framework the government's main role can be seen as a facilitator of productive action by other participants in construction sector.

2.2.2 There is a multitude of other policies affecting demand and supply of the construction industry such as:

a) programming for population growth in most developing countries is the foremost factor contributing to the housing shortage.

b) policy for balanced economic growth and income generation strategies - growing urbanisation lead to rise in number of urban poor which call for employment generation and skill acquisition policies and construction industry has high potential for both.

c) fiscal incentives - both for enhancing demand of construction works and for encouraging endogenous production enterprises of the related products and services.

d) wage policies - construction is labour intensive industry and accounts for nearly 30/35 percent of labour component.

e) environment policies - fast growth in output of the construction industry causes deterioration of physical environment as it impinges adversely on the consumption of non-renewable resources, and causes air pollution through emissions in the extraction and production of materials.

f) energy policies - construction activities are responsible for high energy consumption both in requirements of embodied energy (in building materials and construction) and operational energy (required to maintain built environment). The availability and cost of energy is one prime determinant for building material production.

g) land-use and town planning policies - since land costs may constitute 20% to 60% of total cost of house, it is important, therefore, that in a housing policy adequate strategies are formulated for improving access to land by low-income groups so that construction industry may adequately help in shelter production. Review and adjustment may be necessary to make the legal, fiscal and regulatory framework to respond to the special needs of the poor and low-income population.

2.2.3 In view of the above policy issues it is necessary that national governments should give priority for creating a policy environment conducive to the growth of construction sector. It was concluded in the Second Consultation on Building Materials that : creation of a conducive policy environment should be fostered through national dialogue, with the participation of government representatives, professional bodies, the industry and non-governmental organisations active in the shelter sector. A national-level apex coordination body, with representatives of all concerned should be set up for the purpose. This body should promote the construction sector through intersectoral coordination through reviews and where possible, reforms of sectoral policies, institutional arrangements and mobilisation of resources.

## 2.3 Shelter Production

2.3.1 Global Shelter Strategy to the year 2000 marks a significant shift in search for solutions to the shelter problems particularly in the developing countries. The comprehensive framework for improving shelter delivery provided by the GSS represents a fundamental change and its most important aspect lies in its emphasis on enabling strategies and processes in the field of shelter provision and improvement. The concept of the public sector constructing houses and related services for low income groups has been overtaken by the events, as the demands of rapidly developing urban areas and rising population as a whole have far out-striped the financial and administrative capacities of most governments to provide housing for all. In keeping with the goals of GSS many governments are now moving towards an enabling strategy to mobilise resources and apply entrepreneurial skills for increased housing and infrastructure production, by establishing legislative, institutional and financial framework that will enable the various actors in housing scene to make optimal contributions to their respective shelter situations. It implies strong and coherent government action, including intervention in land, housing and financial markets when they fail to respond appropriately to the needs of low income groups particularly.

2.3.2 Experience in many countries demonstrates that, unless exceptional circumstances exist, direct production of housing by the State is never an efficient use of scarce sources. In Nigeria, for example, commitment to the role of State in shelter production has a long history through successive National Development Plans upto 1983. Ambitious construction targets were set which were never realised. Only around 20 percent of the planned output of low cost units under the Federal Low Cost Housing Programme were actually built during the period 1980-83. This very low level of output had little or no impact on the overall shelter needs. After 1983 the new administration shifted the emphasis to the private and household sectors under the draft National Housing Policy which reorients the role of State in housing production as a facilitator rather than as a producer. From various such examples it can be seen that national government's withdrawal from direct production of housing has helped in improving the shelter delivery as the emphasis now lies in encouraging the process of housing production rather than in centrally targeted housing projects. The role under the new strategy, is increasingly shifting to supporting the innovative experiments in construction technology and building materials through the involvement of NGOs, cooperatives and private companies in the construction of dwellings. India's Building Materials & Technology Promotion Council and decentralised Building Centres at grass root level may well provide a model to follow. Similarly, SENA in Colombia has carried out innovative work in the field of construction related training and education to support shelter delivery.

2.3.3 From the forgoing it will be seen that the most effective role for governments in most developing situations lies in facilitating the efforts of other actors in the shelter process to make their optimum contribution thereby withdrawing from shelter projects and concentrating instead on the process of shelter development.

## 2.4 Significance of Building Materials for the Shelter Sector

2.4.1 Building materials accounts for about 50 percent of basic inputs to the construction industry and in the housing construction materials constitute the single largest input sometimes accounting for as much as 75 percent of a low cost house. Thus there is a growing concern among the developing countries that persistent shortage of low cost

building materials that are durable and can be afforded by vast majority of population, is a serious impediment in improving housing conditions for the people. The problem is particularly acute for the urban low income groups.

2.4.2 One of the underlying reasons why the building materials sector continues to be a bottleneck in low cost housing delivery is that there is a high degree of import dependence in established production units while abundant opportunities for adopting truly indigenous production systems remain only marginally exploited. In most African countries popular materials are inadequate in supply and high in cost. The traditional materials are of low quality and unpopular. New alternate materials developed through research have not as yet been translated into marketable products. In few African countries, no doubt, the efforts have been made to promote building materials production units based on indigenous factor inputs, but only on a relatively marginal scale. This is partly due to inadequate local resources but, mainly, because of the lack of an effective strategy for expanding and developing the local building materials sector. The African continent is rich in raw material resources for building-materials production and potentially, the continent has all the necessary raw materials needed for producing building materials. There are vast deposits of soil, laterite, stone, clay, lime stone, gypsum, pozzolana, iron, bauxite, copper, zinc, asbestos, natural fibres and wood from which building materials could be developed. However, most of these raw materials have remained inaccessible for full scale exploitation due to several constraints. Notably, there is lack of data on availability and characteristics of raw materials and there are institutional as well as financial barriers to available raw materials exploitation. As a result production potential of even the proven innovative building material technologies have not been fully exploited. While there are several factors which have inhibited the growth of low cost locally produced building materials the most important among these is the erratic and often low quality of local production that has failed to inspire the confidence of even the less demanding income house builders.

2.4.3 The low cost building materials industry, operating largely in the informal sector, generally suffers from a lack of basic production management capability often operating at a scale that does not permit viable production. Low productivity and wasteful energy consumption also add to the cost of production. All these factors combine to eliminate the natural price advantage of locally produced materials, shifting the user preferences to conventional building materials, often of imported origin or with substantial import content (in terms of raw materials, equipment, energy, etc.) produced by the modern sector.

2.4.4 A systematic analysis of the underlying factors that inhibit development of building materials and construction industry thereby impeding the housing delivery is called for. What is needed is a strategy to promote local capacity and encouragement to producers to increase their productivity, improve the quality of products and expand the sector so that it can meet the immense demand in respective countries. The accelerated pace of technological change is radically impacting the nature of industrial production and this has brought technology related issues in the forefront for various sectors including the construction material sector. It has to be realised that the changing demand pattern necessitates inducting new technology to enhance capacity of the domestic construction industry.

## 2.5 Lack of Information regarding Nature and Quantum of Demand

2.5.1 In general the needs for housing and related infrastructure increase with growth of

population and nature of demand is largely governed by migration trends in a country besides other factors of affordability, land costs etc. In order to formulate pragmatic policies a demand assessment for construction activities is essentially required. Demand on construction sector are highly fluctuating and unstable as assessment in private sector particularly is not easy - in most countries. Due consideration need to be given to the nature and extent of demand for shelter and derived demand for building materials to ensure optimal utilisation of the resources invested and the affordability of products and components. In respect to housing, demand assessment could be based primarily on purchasing power, socio-economic preferences, life style of rural or urban communities, geo-climatic conditions and the disaster-proneness of the region. Several supply side constraints put inflationary pressure on the building materials and construction sector. Some of these relate to factor inputs such as availability of land and new materials, technology and skills, entrepreneurship and finance, while others are more the result of structural deficiencies in the sector and infrastructural constraints that are imposed from outside. Due to unstable nature of demand, the construction industry is extremely vulnerable, particularly in developing countries of Africa. As a consequence of this instability, both the public and private construction sectors are confronted in most cases with disproportionate increases in operational and financial costs.

2.5.2 Given the compulsions of unprecedented pace of urbanisation and growth of population, traditional concepts of master planning, land-use zoning, development control, building regulations etc. will have to be abandoned and replaced by an approach based on demand management as a coordinated procedure for planning, building, maintaining and renewing the settlement fabric by criteria of cost-effectiveness, productivity and institutional capacity. Under the changing concept of "enabling strategy" the cardinal principle of integrated approach for management of shelter demand will have to be based on the role of both informal and formal sectors, community participation and nature of local resource endowments, and not on characteristically critical activities of a formal construction sector which primarily operates for construction demand of economic and social sectors other than housing and shelter sector. This would give rise to demand for building materials and technologies that are more suited to small-scale construction, as opposed to mass-housing and building schemes based on import-intensive building materials, industrialised systems of construction and contractor-built buildings with formal system of contracting and management.

## 2.6 Structural Weakness and Low Productivity of the Construction Industry

2.6.1 In most countries in the African region, low productivity of the construction industry has been a major obstacle to improving its capacity to meet the rising demand of housing. The main barriers to improving the productivity of the industry are: (i) poor technological capacity of the industry; (ii) over-reliance on imported materials coupled with worsening foreign exchange situation for public manufacturing enterprises; and (iii) structural deficiencies in the domestic construction industry in most LDCs. Removing these constraints will require sustained effort of all those associated with the industry supported by international cooperation.

2.6.2 The major concern of the construction industry in developing countries lies in its apparent backwardness and slow pace in the adaptation of new construction technologies and practices which can help in cost reduction and improvement in durability and quality. In the residential construction industry technological advances are generally not visible while such advances have percolated at the level of practice

in other sub-sectors of construction. New developments if widely adopted can increase efficiency in shelter delivery programmes through improvd productivity of construction industry. The main reasons for low productivity include (a) industry is highly fragmented with disjointed material and product delivery system in the developing countries generally, (b) inability of small firms to fully exploit promising new technologies, (c) high degrees of uncertainty resulting from cyclic nature of the building industry, (d) poor quality of labour due to inadequate systems of skill upgradation, and (e) formidable institutional barriers imposed by government building codes and development regulations developed in colonial times.

2.6.3 From the above it can be concluded that construction industry in majority of LDCs in African region lacks endogenous technological and production capacity to meet the shelter needs of poorer sections of their population. In past several countries in the African region attempted to improve their production capacity through the importation of production facilities. This, no doubt, helped to meet the short-term needs of the country, but experience has generally shown that more often than not such measures led to a continuing dependence on imported factor inputs with little increase in domestic technological capacity.

2.6.4 Such transfer of packaged technology did not strengthen the domestic industry and sustainable development of production capacity did not occur. There is, therefore, a need to change the policy so that it will help in removing structural weaknesses by transferring such technologies from other countries which would be compatible to and adaptable at the development level of local industry. International cooperation to accelerate technology transfer across national borders should be such that encourages building of operative linkages between transferor and recipient. Gains in technological capacity in the domestic building materials and construction industry should be reflected in reduced import dependence, increased availability and a lowering of prices of materials and construction costs.

## 2.7 Trends in Construction Industry Technology

2.7.1 The impact of technology is yet to be felt in the construction industry of developing countries particularly least developed countries of Africa in the same way as it has been experienced in rapidly industrialising and industrialised countries of different regions. For a variety of reasons, attempts at diffusion of advanced construction technologies from developed countries have not succeeded in the past while little effort has been made to improve the traditional techniques and the productivity and quality of domestic construction methods. Historically, social progress and the development of regional typologies determined the level of housing technology. Studies attribute the technological weakness of the Least Developed Countries to a number of factors which mainly include:

(a) a very low level of accumulation of technology;
(b) a limited capacity to import technology - owing to a weak foreign exchange earning capacity and inability to attract foreign investment;
(c) lack of capacity to adapt imported technologies due to shortage of required skills at enterprise levels;
(d) tendency to adopt import intensive models of industrialisation which lack the stimulus that industry could provide for the development of local technologies;
(e) failure to integrate science and technology with the National Development Plans;
(f) insufficient investment in science and technology owing to economic limitations and a relatively undeveloped private sector;

(g) inability to select and manage suitable technologies owing to shortage of technology personnel;
(h) insufficient institutional infrastructure for promoting private sector initiatives based on advances made in other countries; and
(i) the lack of mechanisms supporting the transfer of suitable technologies from the industrialised countries and technological cooperation among the developing countries.

## 2.8 Linkages with Other Economic Activities

2.8.1 The progress in the development of the construction industry is generally driven by improvements in materials, tools and equipment and appropriate technology. New methods have been introduced into several disciplines in the construction industry in developed countries generally in conjunction with material, component or equipment innovations. In developing countries, however, incorporation of such new methods have not been possible due to lower technological level, limited foreign credits and inadequate internal transport systems.

2.8.2 In the area of building materials it needs to be emphasised that assistance in only developing traditional materials even in their modern modifications and improvements, entails the risk of impeding progress. A second approach has also be to be followed parallely that is the development of the new materials and building products either through local research or international assistance and cooperation, provided that such developments are compatible with the availability and cost of the energy and local raw material resources in the country as well as the prevailing policy on capital/labour complementarity.

2.8.3 In the area of building equipment the contribution of tools and equipment may differ from almost nil in case of traditional small rural shelters upto 50 percent in precast and prefabricated dwellings. But this should not lead to an under estimation of the significance of tools, instruments, machines and transportation means as part of construction process. In the interest of quality, efficiency and speed it will be a mistake to ignore the benefits of certain level of mechanisation. It will, therefore, be desirable to introduce construction equipment and simple machines which can be locally produced and locally assembled rather than borrowing sophisticated foreign machinery.

2.8.4 In terms of appropriate technology it is necessary to select building materials and construction techniques depending upon the requirements of the housing schemes and also if they are carried out in urban or rural settlements. Similarly the availability of transportation network may influence the selection of technology. For selection of technologies from other countries the technical feasibility of adaptation should be checked at different levels such as installation; operation; maintenance; production process; and repairs by local skills and services.

## 2.9 Regulatory Measures and Documents in the Construction Sector

2.9.1 The socio-economic importance of the construction sector in any country is so high that its extensive and multifold regulation is significant with respect to habitability of the built environment, performance of civil engineering works, durability of construction outputs and above all safety against building loads, environmental influences, fire and natural hazards which are fundamental public issues and may call for legal action. Existence of regulatory documents, standards and codes, their enforcement and a

techno-legal regime to guide the activities of construction industry is crucial to the efficiency and development of construction industry. Some of the essential regulatory documents which are required within the construction sector will include:

i) Legislation on land use
ii) Urban regulation,
iii) Essential requirements to regulate the quality and performance of components and products to be used in construction works.
iv) Standards for materials, building products and installation
v) Codes of practice for traditional and innovative construction techniques
vi) Methods of evaluation and validation of technology
vii) Technical approval systems and regulations
viii) Quality assurance schemes and certification
ix) Liability and insurance

2.9.2 The existing framework of above facilitatory and regulatory mechanism will have to be analysed in order to improve methodologies, technologies and procedures to improve housing delivery through appropriate intervention in development of construction industry.

**2.10 Lack of Research and Development Infrastructure**

2.10.1 R&D is not synonymous with technology development but it is one of the main ways by which technology development takes place. Since R&D contribute significantly to the growth in productivity and its status of development, existence of relevant institutional framework and system of transfer of research results from lab to land are important components of construction industry of any country. For improving capacity of construction industry to support a healthy shelter delivery system role of R&D can not be over emphasised. In the industrialised countries, both technological and R&D cooperation among major enterprises (between component suppliers and equipment producers; equipment producers and end-users; partners from the same industry etc) has helped in improving the capacity of construction industry to cater to the rising demand. However, in the developing countries such technological cooperation is very limited within various partners of construction industry. Yet other problem in the developing countries pertains to lack of technological innovation in construction practice. This is mainly due to (a) poor communication between innovators and users, (b) lack of attention by R&D institutions to users needs, (c) inadequate market research leading to insufficient attention to product design, and (d) general inadequacy of R&D programmes and methods.

**2.11 Lack of Institutions for skill upgradation,Human Resource Development**

2.11.1 At present in majority of least Developed countries in Africa, there are no effective institutional structures for technical skills training, or for providing significant supports to small scale and informal construction sector. Studies of the small scale construction enterprises indicate that it is particularly vulnerable due to lack of technical and managerial skills which leads to inadequate quality, low productivity, large number of bankruptcies and a poor record of working conditions. This calls for suitable institutional mechanisms to be set up in each country (at sub-national levels in a large one) for providing integrated range of complementary services which can make a significant contribution to the professional and development of the small-scale contractors/enterprises while at the same time creating value for the clients utilising contractor's services.

## CHAPTER 3

## IMPEDIMENTS TO EFFICIENT PERFORMANCE OF THE CONSTRUCTION INDUSTRY - affecting provision of affordable quality shelters

3.0 In this section it is intended to focus attention on the factors which inhibit growth and development of construction industry in most developing countries particularly in African region.

3.0.1 As has been highlighted in earlier parts of this study the construction industry has multiple inter-relationships between its various components on one hand, and between parts of governmental policy and social issues on the other. In majority of cases the inter-dependence is very strong within different factors impacting its functioning, growth and development. It is also clear from experiences in several developing countries that a lot of improvements were possible due to proper interventions external to the entire system of construction sector. Yet, a lot of bottle-necks remain, they may be different from country to country or even in a country may differ in different times. The fact cannot be ignored that developing countries in the African region present a large variety of situations. Firstly there is a variety in local resources, such as wood may be abundantly available in some country but extremely rare elsewhere. Then there is a variety in levels of industrial development hence building materials or construction may have varying support systems within overall productive sector. Besides, there is a variety of opportunities to implement complementarities between countries at a regional or sub-regional level. Finally there would always be a variety in expectations of the peoples as regards housing standards impacting housing production programmes.

3.0.2 The building industry in the context of African countries can be broadly classified according to the major sources of raw materials : those based on imported materials and technologies; and those which rely entirely on locally available materials. The other characteristic feature which can be the basis for categorisation for building industry in most of these countries could be two radically different scales of operation. At one end is the vast number of small scale and micro scale enterprises producing a significant share of the total output of the industry in a highly dispersed manner. At the other end, are the large scale mechanised and sometimes automated plants producing cement, bricks, roofing sheets, sanitary wares etc. and civil engineering projects with advance technology of design, supervision and monitoring by imported know-how. The major constraints to improving the productivity and quality outputs and reducing production and distribution costs specially in the small scale and informal sector include lack of policy support, institutional set-up, appropriate technology, standards and specifications, information dissemination etc.

3.0.3 Any study on the construction industry with special focus on housing should recognise the need to include various aspects of construction as it has economic, social and political implications in the context of housing programmes. Construction technology in shelter and human settlements sectors embraces the process of planning, designing constructing and managing, repairing, maintaining, altering and demolishing of buildings and items of infrastructure. It includes the materials, organisations, procedures, information and plant & equipment used in the construction industry. Thus, construction technology transcends the use of machines and its considerations are far wider than the choice of combination of labour, plant & equipment for particular operations. Construction technology relates to all the participants of construction

industry. It is, therefore, imperative for the Governments to take the responsibility of planning, coordinating and controlling the development of construction industry in order to ensure the evolution of an efficient and capable industry able to optimise its resources, and to meet the various demands put on it. However, it is clear that the construction industry in the developing countries of Africa despite abundance of labour force and natural raw material resources, has not achieved its potential for employment generation or to exploit raw materials appropriately in meeting the shelter demand of nearly 50% of their population living in sub-standard and unhealthy conditions. Following paragraphs indicate some of the main factors which inhibit the development of adequate capacity in the domestic construction industry of various developing countries in the region:

## 3.1 Difficulties in Demand Estimation

3.1.1 Lack of evaluation of the real nature and extent of demand for various categories of housing inadequacy in the public and private and formal and informal sectors lead to disproportionate increases in operational and final costs. An analysis of housing indicators *(Annexure-II)* as obtaining in African countries indicate that estimation of housing and related infrastructure demands in formal and informal sectors is not easy. The income ranges (consequently affordability levels) priority of preferences of low and moderate income households in rural and urban areas, and other not easily quantifiable data, if properly analysed, may lead to several divergent scenarios. Formal statistical methods to evaluate housing demand used in developed countries cannot be adopted to in these countries. Policy formulation (targets to be achieved) and implementation is highly dependent on the total construction demand in terms of materials, equipment, skilled workers etc.

3.1.2 Thus lack of suitable demand assessment methods in most developing countries in African region come in the way of progress of shelter delivery programmes as local construction sector is not in a position to know the priorities for various options such as (i) in-situ upgradation of dwelling units by low-income families, (ii) addition and alteration in existing dwellings, (iii) resettlement or construction of new housing units and infrastructure provision, (iv) rural housing activity or inner city rehabilitation, etc.

## 3.2 Land Use and Town Planning Policies

3.2.1 Access to land is a pre-requisite to provision of shelter. In developing countries in African region it is a major issue as land costs may constitute 20 to 60 percent of the total cost of a building. Though the indepth analysis of this specific aspect and its impact on performance of construction industry are not in the scope of the present study but in the context of the delivery of affordable shelter it is important to realise that in most African countries legal and regulatory framework relating to the planning and land-use are inflexible and inappropriate. These are unsuitable to local conditions now obtaining in low income rural and urban settlements and militate against flexible and cost-effective construction. Rigid segregation of land-use is another critical factor which discourages cost-effective development of residential areas. The failure to adopt appropriate rural and urban land policies and land management practices, lead to increasing housing costs, many a times occupation of hazard prone lands, unauthorised building activity and unsafe construction thereby leading to poor habitability and quality of housing.

### 3.3 Incompatible construction technologies and lack of capacity for technological upgradation

3.3.1 The technological disparity between the developed and developing countries remains wide in the construction sector. Impact of technology is yet to be felt in the construction industry of most African countries in the same way as it has been experienced either in other fast industrialising or industrialised countries. Though in some cases use of the modern equipment, imported for big construction projects, was also employed at housing projects but shortage of skilled operators/mechanics, spare parts fuel etc. led to low level of utilisation. For holistic growth the construction industry in developing countries requires both the modern and the traditional labour intensive technologies -the former to meet the needs of organised construction sector and the later to meet the needs of housing sector particularly catering to the need of low-income population. While choice of appropriate technology is crucial to speed up shelter production, the traditional sector mostly operating through the small scale and informal activities continue to rely on traditional technologies which are often rudimentary resulting in poor productivity, poor quality, eventually to poor profitability, ultimately limiting the possibility of wide scale adoption of their products in the construction. Most African countries have failed to stimulate an indigenous development and supply of technologies to its small scale informal sector to replace or upgrade traditional technologies.

3.3.2 In the absence of proper approach to selection of technologies there is a tendency to waste expensive materials in low-performance uses such as dwelling construction. In some cases as in Tanzania and Botswana, for example, special "masonry cements" were successfully used leading to 30% cost reduction compared to use of normal portland cement which continues to be used in all types of housing construction in most countries.

3.3.3 The lack of indigenous capacity for upgradation of technology level and process of innovation in the building materials and construction is mainly due to two reasons; firstly, the bulk of industry operates through small scale sector which has little capacity in terms of capital or skill to invest in innovation and technological upgradation, secondly, the general lack of orientation of the building research institutions to devote their limited resources to the development of technologies responding to the specific needs of the local building materials and construction industry. The choice of appropriate technology is crucial to efficiency in shelter production, but this, by itself, is not enough. The capacity of the construction industry will have to be enhanced simultaneously to enable it to accept, adapt and efficiently use new building materials and construction technologies. It is because of lack of innovation and limited technological capacity that the available appropriate technologies are yet to make a significant impact in the provision of housing in less developed countries of Africa. Innovative approaches do not mean that they are sophisticated techniques as generally commented upon. Infact innovation is a matter of developing alternative solutions to meet vital building needs in developing situations, at the lowest cost. These innovative approaches can, with an equal amount of financing, give far better results than those obtained through usual methods. Use of earth blocks for example, can compete with classic materials, if produced with appropriate machine or equipment.

### 3.4 Lack of recognition as an industry and existing economic conditions and lack of coherent public policies hamper sustainable development of construction industry

3.4.1 In most developing countries as mentioned earlier, building materials and construction industry has not been accorded the status of industry. Thus the benefits normally allowed to industrial enterprises under the other productive sectors like financial assistance from banks and financial institutions, supply of important raw materials at industrial rates, and other fiscal incentives are not available to construction enterprises. In addition, this sector of industry is highly vulnerable due to fluctuation in demand and migratory trends. During the period of economic expansions the construction industry normally grows at a faster rate than other sectors, whereas in the period of economic stagnation and recession the industry is generally the first one to feel a negative impact due to lack of demand. The lack of statistical database and information on building permits, imports, production statistics in most developing countries inhibit planning and forecasting by the building materials and construction enterprises thereby hampering its sustainable growth.

3.4.2 A substantial portion of the population in any country in Africa does not have the economic capacity to acquire modern housing and large number of families have to resort to self-help housing in order to reduce costs. In such a situation these bulk of families do not acquire materials and components from the formal market. This results in unpredictable demand situation, as mentioned earlier, for producers of building materials and other enterprises in construction sector.

3.4.3 So far most developing countries in Africa have not made any sustained effort to achieve building materials production , based on their natural resources and appropriate technology. This is mainly due to lack of an effective and coherent strategy for expanding indigenous building materials sector. Sustainable development requires a policy framework for the construction sector that effectively addresses the twin requirements of sustainable management of construction resources (land, materials, skills, tools) and the control of degradation of the environment caused by adverse impact of construction activities. The range of measures will include specific initiatives in different areas of policy, particularly in the domains of policy on tariff protection to fledging industries, investment policy (tax concessions, fiscal incentives), technology policy ( increasing emphasis on innovation, labour-intensive and energy-efficient technologies), manpower development policy (upgrading skills, entrepreneurial capacity of local contractors/enterprises) and natural conservation policy (to prevent indiscriminate extraction of raw materials and disruption of ecology). Institutional strengthening and promotional measures are equally crucial for the implementation of these policies.

### 3.5 Existence of outdated building bye-laws, standards and codes of practice and low level of regulatory documents

3.5.1 Building bye-laws and regulations are fundamental regulatory documents used by municipal authorities and local bodies in most countries. These describe in general terms certain targeted functions of housing, buildings and other developments in human settlements. In the countries of Africa like many countries in Asia the bye-laws formulated in colonial period still exist without having been revised and updated. These antiquated regulatory documents on one hand do not permit any innovation in planning, design and construction of houses, while on the other hand inhibit use of innovative locally produced building materials and appropriate construction techniques.

Many of these countries lack capability for formulation of national standards and codes of practice, which further delay in adoption of new technologies in the construction of housing and building.

3.5.2 In several African countries there are specific local building materials which, despite being potentially viable, have not had any impact on construction practices while there is a possibility, by their use, of optimising the construction costs in the area of housing and building. The main reason for this situation is absence of appropriate standards and specifications to (a) provide quality control in production; (b) ensure competitiveness in cost; and (c) promote their market acceptability. Some of such materials and products include, fibre concrete roofing tiles and sheets, stabilised soil blocks, building bricks/blocks from industrial and agricultural wastes. Since standards for local building materials are inseparable from technologies of production and use in construction there is a need to promote formulation of standards and specifications on new local materials and to bring about such amendments or modifications in building bye-laws which would permit their use in construction of buildings.

3.5.3 In this connection it is relevant to mention about the Workshop on Standards and Specifications for Local Materials which was organised in March 1987 jointly by African Regional Organisation for Standardisation (ARSO), the Commonwealth Science Council (CSC) and the United Nations Centre for Human Settlements (Habitat). The experience of these workshops points to the fact that it is a difficult task to promote standards for local materials effectively. Unless a creative and seemingly complex method is adopted it will be difficult to break down some of the barriers facing the formulation of standards and so pave the way to adoption of materials and techniques based on local resources and skills.

### 3.6 Existence of Large Size of Informal Sector and Lack of Optimisation of Resources between formal and informal Construction Sectors

3.6.1 Construction of housing units is a critical area for action because this is a process during which inputs are transformed into outputs (shelter). If government action is misdirected at the production stage, then the shelter process will be considerably constrained. Although public agencies play an important role in getting things, started unless private sector is deeply involved and motivated to supply, infrastructure and funds none of the desired goals of shelter which benefit all actors involved will be achieved. There are many different actors involved in shelter production, and the key objective as defined by the GSS is to marry their efforts together in such a way as to achieve the optimum contribution of each. There exists a great heterogeneity in building materials and construction activities due to mix of formal and informal sectors operating in almost all developing countries.

3.6.2 Most construction materials and techniques used in the informal sector are indigenous to the local area and are usually produced by small scale entrepreneurs and family businesses. The informal construction industry which operates both in rural and urban areas, for example, does not rely solely on building materials produced in the informal sector, builders may buy or scavenge materials produced by formal sector manufacturers. Similarly, agencies operating in formal construction sector may buy materials from informal producers to save costs and obtain products for which no substitutes from formal sector exist or to evade taxes or labour regulations. For example, the most brick production in India comes from the 'unorganised' or informal sector. Similarly, Human Settlements of Zambia (HUZA) operates a scheme in Lusaka, developing reinforced soil-cement blocks, fibre-cement roofing sheets (using sisal

fibre), solar heating and cooking gadgets and other innovations in a number of upgraded compounds in the city (Turner B.1988). Time and again, poor people in urban squatter settlements and other material production units operating in informal unorganised sector have amply demonstrated that given a chance they can create housing at lower cost than either public or private sectors. This fairly large size of informal sector producing building materials from local resources and helping poor to construct their own dwellings with self-help and small contractor supported efforts is unable to develop or absorb new appropriate technologies because of lack of information and poor financial capacity for technology sharing from other sources. Thus this sector, though catering to a sizeable demand of shelter for the poor, does not possess capacity to improve productivity, speed and quality in shelter production. While on one hand such informal sector activities strengthens the supply side of shelter delivery for the poor and low-income groups, on the other side inhibits technological development of construction industry and fuller exploitation of local resources. In Kenya and Cote d'Ivoire during 1970s, the informal sector covered almost one third of the total value of the construction sector (HABITAT : The Construction Industry in Developing Countries Vol.1, Nairobi, 1984). This include 60% of shelters produced and higher percentage of workers employed as informal sector is a better employment generator. The requirements of enterprises in informal sector need to be addressed and their efforts supported by facilitating their access to raw materials, credits and improved technologies.

3.6.3 Large civil engineering works are important for national economy but such projects are capital absorbers. Both the government agencies and private construction industry find these attractive commercially and devote most of their resources for such projects. In the process, market of house construction, particularly for low income dwellings suffer without any drastic intervention either from state or construction industry. For large construction projects, substantial know-how, technologies, materials, equipment, managerial capacities are imported but these fail to improve capacity of local construction industry dealing with housing construction, as no vertical integration channels exist between small scale enterprises (both in material production and construction business). It is, therefore, necessary to integrate and optimise resources of formal and informal construction sectors in order to enhance capacity of local construction industry in different aspects.

## 3.7 Poor Capacity for Selection of Technology

3.7.1 A range of alternative technologies for production of basic building materials and products like cement, lime, pozzolana, bricks, blocks of various types, roofing materials are already available in developing countries of Asia, Africa and Latin America. Several of these new and alternative technologies such as mini-cement production process, fibre concrete roofing, ferrocement for walling and roofing, etc. have also been developed. Some of these technologies use semi-industrial processes while others employ mechanised or automated plant based processes. The prevailing mix factor proportions in developing countries, for example, capital scarcity, shortage of foreign exchange, surplus cheap labour and scattered nature of raw material deposits and rising energy costs usually favour labour intensive, small scale production methods rather than capital and energy intensive industries. Even when small scale technologies are acquired in a developing situation, problem often surfaces during early stages of operation for reasons such as process incompatibility with locally available raw materials, failure of the final product to offer a clear price advantage over other already available products in the market. For example, the lime pozzolana project sponsored by OXFAM and executed by SIDO in Tanzania ran into difficulties

as the price advantage of its product over portland cement was only marginal, although its technical performance was consistent with the required specifications. Similarly use of FCR technology ran into trouble in many African countries as the seemingly simple operation of vibrating table became an insurmountable problem in remote areas.

3.7.2 The inability of domestic construction industry in most developing countries to make deliberate choice in acquiring new technologies has often led to the transfer of inappropriate outdated technologies from developed countries. Acquisition of such technologies is a retro-grade step for which many countries in Africa have paid heavily. The experience accumulated so far have proved that, in contrast to most other sectors of national economies, the building materials sector offers opportunities for lessoning import-dependency by promoting indigenous production capacity. However, one of the main reasons why opportunities for production of local building materials have not been widely taken up in African countries is that are serious gaps in transfer of technologies or the commercialisation of indigenous innovations in materials and construction technology area. In such a scenario there is a need for strengthening the capacity of developing countries to make rational choice of technologies which are most appropriate to their level of development. Capacity building in this area would require to concentrate on developing two essential resources; (a) the availability of information on alternative technologies with their merits and demerits, and (b) accessibility of local entrepreneurs to such information and other supporting systems.

### 3.8 Lack of Information and Transmission of Experience

3.8.1 One of the main barriers in technology transfer among developing countries is related to the limited amount of information exchange. The absence of any systematic information flow between the developing countries has resulted into wasting of scarce resources and general lack of progress in the area of development of local building materials and construction practices. In order to make information exchange as an effective tool to technology transfer, analysis of information needs for a country specific situation should be undertaken. No information can be processed or used effectively if it does not satisfy the needs - prejudices and preferences- of users or if the users do not trust the source of information. The information flow should, therefore, be based on the requirements of major actors indicated below who impact the policies and activities of construction industry.

- those supplying knowledge and information such as R&D, standardisation and educational institutions, data bases, mass media;
- those applying knowledge and information to decisions, plans and programmes such as authorities, associations, entrepreneurs, planners, designers and programmes;
- those applying information in techniques and process for the production of materials and services for delivery such as processors, producers and contractors
- those supplying goods and services for consumption and usage and maintaining the delivered goods and services, such as administrators controlling distribution policies, local professionals, agencies concerned with technical assistance to enterprises.

3.8.2 An important reason for the present unsatisfactory situation in the area of information dissemination is that industrial and building research institutions in most developing countries have very little networking facilities with other such institutions, even within their own region. With the result they have very little access to information on new and

innovative technologies coming into the market from the R&D institutions. In recent years a collaborative effort of the UNCHS (Habitat) and the Commonwealth Science Council has strengthened the information dissemination capacity by establishing a network of African countries for the promotion, of collection, collation and dissemination of information relating to local building materials and technologies among the participating countries. A similar initiative of the UNDP and UNIDO has led to the establishment of the Regional Network in Asia Pacific for low cost building materials, technologies and construction systems. In a similar initiative a proposal has been recently developed by UNIDO for an Inter-Regional Programme of Cooperation between Asian and African countries in the area of fibre-reinforced composite materials based on local resources.

3.8.3 In order to strengthen technology transfer through information exchange, information-cum-demonstration centres should be setup to make available complete technological information on alternative technologies to prospective entrepreneurs. The presence of such centres will not only help prospective entrepreneurs in the selection process but would also help other agencies promoting industrial development such as small scale industrial development organisations, financial institutions etc.

## 3.9 Problems of Evaluating Appropriateness of Technology

3.9.1 Availability of information by itself is not enough to make an adequate choice of technology. Assessment and evaluation of the techno-economic feasibility of every option is essentially required in the context of a country situation. In different stages of such a evaluation, several endogenous factors are to be taken into consideration such as size and spread of the market, local resource endowments, cost and availability of energy, consumer preferences etc. in order to decide on the appropriateness of the technology. In small scale building materials sector in most African countries there is a serious lack of capability in evaluating new technologies. Since most of these small scale enterprises do not have any link with the research institutions or testing laboratories, they are unable to properly evaluate the suitability of a technology. Industrial promotion agencies in the countries Africa have so far played a very limited role in supporting small entrepreneurs in selecting new technologies. Similarly, the financial institutions in these countries also do not extend any assistance to entrepreneurs with financial analysis of investment projects involving transfer of new technologies. This is not because of the lack of technical manpower in the industrial promotion or financial agencies but more importantly due to lack of linkages of these agencies with research institutions and other organisations responsible for technology development.

## 3.10 Private Construction Industry versus State Enterprises

3.10.1 For a certain period in the past, Governments in many developing countries had the tendency to under estimate the importance of specialised construction enterprises. Thus state-enterprises were mainly used in implementing housing and civil-engineering construction programmes. And this invariably resulted in high costs. The Second Consultation on Building Materials Industry clearly brought out that, "Entrepreneurs are the central actors in and the driving force behind the growth of the sector. A national strategy should, therefore, strive to involve the entrepreneurs in all decision making processes". This conclusion brings into focus the necessity to consider the roles of State agencies as against that of private enterprises. In view of the remarkable instability of construction market, as pointed out already, high inelastic costs in a state enterprise may make economic efficiency unworkable - as is evident from large

number of housing projects being implemented through state housing agencies and public works departments. That is why the flexible, 'multi-sized' geographically spread, private construction enterprises or 'artisan groups' are to be recognised as critical instruments in implementation of housing programmes. These also have, once regulated through policy intervention, capacity to involve community groups, CBOs and NGOs in housing construction.

### 3.11 Major Constraints required to be addressed at National, Regional and Sub-regional Levels

3.11.1 Summarising the various factors mentioned already, it can thus be seen that the following major impediments exist which hinder its efficient performance and further progress of the construction sector to meet the needs of affordable shelter programmes;

i) The fragmented nature of construction industry and uncertainty in demand from public and private sectors makes it difficult and expensive for the construction enterprises to deliver their services and products at desired pace. Low level of development compared to other industrial activities is common to all countries.

ii) Large size of informal sector activities without which lack good management practices or capacity for technological upgradation.

iii) Lack of desired operative interface between the various participants of the construction sector, the decision makers, financing agencies, promoters, contractors, professionals, building material manufacturers & suppliers, equipment manufacturers, R&D and standardisation organisations.

iv) General shortages of financial resources and lack of access of the small and medium construction firms to institutional finance and lack of any vertical integration with large construction enterprises.

v) Lack of an integrated approach to technology transfer, innovation and upgradation of building materials, their production processes and delivery systems and transfer of research output from lab to land.

vi) High economic, cultural, regional and climatic diversity throughout the region, leading to a large range of building patterns and standards.

vii) Persisting dependence on energy intensive and material wasteful methods of construction.

viii) Slow progress in improving the regulatory mechanisms and legislative control on land use.

ix) Lack of extensive national effort required for development of standards and set up mechanisms for their practice and enforcement to facilitate use of innovative building materials, products, installations and construction techniques.

x) Lack of awareness on part of enterprises and managers, concerning the gains with adoption of quality and productivity standards, in terms of lower costs and better competitive capacity.

xi) Labour laws and governmental regulations stand in the way as significant institutional forces restraining the development of construction activities since the construction is still not recognised as industry in majority of countries.

xii) Declining quality of skills, lack of training programmes for small contractors and entrepreneurs and low perspectives of salary gains through specialisation at all levels. Lack of institutional arrangements for upgradation of skills and human resource development in majority of LDCs.

xiii) Inadequacy in fiscal and other incentives at central and provincial levels for the construction industry and its products (such as materials and components).

xiv) Lack of policies and promotional efforts for enhancing production and application of innovative alternate building materials particularly based on energy efficient technologies, and recycling of wastes which are renewable raw material resources.

xv) The general policy of all related sectors for contracting services or buying of materials is based on lowest price concept and not on quality and the concept disregard the life-cycle costs.

xvi) Lack of concerted national effort in improving the efficiency and output of the construction sector.

xvii) Lack of continuing interaction between R&D & field organisations; professionals & decision makers; and specifiers & suppliers of materials.

## CHAPTER 4

## PROPOSED OPERATIONAL STRATEGY FOR THE DEVELOPMENT OF THE CONSTRUCTION INDUSTRY WITH FOCUS ON HOUSING

This chapter presents the rationale for formulating national strategy for enhancing local capacity to meet needs of affordable quality shelter in Least Developed Countries in Africa. It illustrates the long term and immediate objectives, basic principles, short-comings in the existing practices and components of the suggested strategy. Based on the strategy a plan for national and international action has been outlined in the form of "specific points for consideration" by the Consultation (included in next chapter). All components of a national shelter strategy must be directed towards the production and improvement of large quantities of housing units to meet growing needs. This means the capacity of the building industry will need to be enhanced in line with the objectives of economic growth and in keeping with the natural resource endowments of each country.

### 4.0 RATIONALE

4.0.1 Within the framework of Global strategy for shelter all countries increasingly realise their commitment to goals of adequate shelter for all and are in the process of formulating their National Plans of Action. The GSS recognised the need to formulate a strategy based on common principles, policies and approaches underlying country specific actions for a strong construction industry. The rationale for operational strategy for development of construction industry is, that;

i) Success of national action in shelter sector in each country will depend to a large extent on the availability of basic building materials at affordable prices and a strong construction industry based on cost-effective construction techniques, management capacity and optimum use of local resources of skills and capabilities at different levels.

ii) Amendments and adjustments in the policies and institutional structures are required to be introduced and implemented by all countries (including Least Developed ones in Africa) in accordance with country specific needs, to respond effectively to the major supply side and demand side constraints in the shelter delivery particularly for low income groups.

iii) The measures' aimed at development of construction industry can be effectively formulated and implemented by utilising opportunities available through international co-operation, amongst countries of the region, with developing countries in other regions and with developed countries.

### 4.1 OBJECTIVES

4.1.1 The overall objective of the operational strategy is to stimulate action for facilitating achievement of affordable shelter for all. The specific objective is to facilitate the required supply of building materials and construction technologies for affordable quality shelters based on accepted standards, quality, liveability, health and safety.

## 4.2 BASIC PRINCIPLES

In the long run, deep rooted structural changes in institutions, legal and fiscal measures and resource allocation policies will be required to sustain public sector's role as facilitator and it is imperative that projects and programmes are conceived and designed within the framework of overall restructuring process comprising following action areas rather than taking isolated initiatives.

### 4.2.1 Support for enabling strategies

4.2.1.1 A popular misconception about enabling approach enshrined in GSS is that it means less or no role for the government in shelter sector. But it needs to be understood, and perhaps being realised gradually by most governments, that while it does imply fundamental changes in the distribution of responsibilities for different aspects of shelter production and improvement, the new role for government continues to be critically important. This role no longer expects governments to continue with state-administered housing projects but lies in facilitating and regulating the overall framework within which other actors can make their contributions in most effective way.

4.2.1.2 It is observed that despite commitment to Global Strategy for shelter, governments and public agencies in most developing countries continue to take up projects for constructing complete housing schemes. This is resulting in investment of meagre resources in a few projects leaving the vast majority of people to fend for themselves. By and large, there is no large scale interventions in squatter settlements and slums in urban areas and shelter problems for poor in rural areas except for occasional upgrading programmes that provide basic services. Even in projects that are specifically designed (in rural and low-income urban settlements) to promote or support people's action, in the sites and services and slum upgrading projects, public agencies in these countries have a tendency to adopt the traditional "Public works" approach and undertake schemes with help of contractors thus marginalising people's participation.

4.2.1.3 In many countries, given the situation of severe shortage of finances to provide finished standard housing, the state agencies have characteristically resorted to rules, regulations, bylaws and procedures to control private housing and building activity. Here too, the action on the part of public agencies have repeatedly proved to be inhibitive rather than enabling as existing standards (not revised since colonial times) are set too high and procedures too long for private house building activity to adhere to.

4.2.1.4 What is more important is the fact that even though policy emphasises that public agencies should support people's housing efforts, there is little initiative from implementing agencies themselves. It seems that agencies that take up shelter support programmes, do so simply because money is available, and given a choice they would like to opt for supply of finished housing.

4.2.1.5 Too little effort has been made in the past to significantly improve the access of the poor to the required housing finance. A part of the problem lies in the fact that the essential policy perspectives on shelter have been almost non-existent. It is therefore necessary governments at the appropriate levels should adjust monetary and fiscal policy to strengthen the effectiveness of existing housing finance systems and should promote new financing mechanisms. Such activities must be targeted specifically towards the needs of those currently living in urban slums and squatter settlements, and in substandard rural dwellings. Gramin Bank in Bangladesh and SEWA in India *(Annexure-III)* for example have evolved innovative banking mechanisms to improve

access of the poor families to housing finance.

4.2.1.6 In the area of building materials and construction technologies, the enabling strategies would include providing support to small scale sector of material production, strengthening small contractor's capacities and small and medium size construction enterprises to meet the rising needs of shelter sector. Though it does not mean that all building materials and products should be produced locally or through small scale units but it requires that national strategies for materials supply should be designed to support small-scale decentralised production of building components and elements wherever possible. The strategy should also promote local initiatives in the production, distribution and use of building materials, enabling local communities to share in the responsibilities and benefits associated with the development of building materials sector. The standards and bylaws should be modified and wherever necessary new ones formulated to permit use of innovative materials and construction techniques in housing construction and upgradation. Technology interventions should be planned so that housing for the poor, particularly receives the benefit of cost-effective new building materials and construction techniques.

4.2.1.7 In view of the foregoing major areas to be addressed in the operational strategy should include the following;

i) Institutional restructuring and skill development.

ii) Revision of norms, standards and bye-laws and planning and approval procedures.

iii) Improving access to housing finance, land, appropriate building materials and technology.

iv) Incentives and encouragement to private sector, NGOs and cooperatives to work as partners with public agencies in housing sector.

v) Encouraging upgradation and improvement in durability and life of existing house types.

vi) Special measures should be evolved to address the shelter needs of disadvantaged and vulnerable groups.

vii) General policy related issues to enhance capacity of construction sector to meet housing needs particularly of low-income groups.

### 4.2.2 Reorienting role of governments, public agencies and related policies

4.2.2.1 It is necessary for the governments at national and provincial levels to adopt the policy of public sector operating as facilitator rather than builder in the housing sector. It is, therefore, necessary to shift the focus on the developmental role of the governments. Planning and policy formulation is the starting point of any sectoral programme like shelter sector. This should be the basic responsibility of the Government and public agencies. The responsibility may be classified into establishment of (a) Data and Information system to help determine needs and demand of housing in different provinces and sub-regions, evaluate priorities and assess affordability of different segments of population; (b) Undertake policy planning and formulate alternative solutions; (c) Prepare action plans with time schedule, functional responsibilities and

allocation of work to implementing agencies; (d) setting up evaluation mechanisms to help monitor programmes and undertake revisions in action plans if required.

4.2.2.2 With reference to construction industry, government's policies in various other sectors impact the economic and legislative environment in which the enterprises operate. This requires an inter sectoral policy adjustments as construction sector draws its inputs from and supplies its output to all other social and economic sectors. The primary task of the government is to formulate supporting policies in other sectors so that construction industry is able to meet the demand from all sectors including housing and human settlement. This would help in creating an enabling environment in construction sector for higher productivity and technological capacity. Wide-ranging public policies affect the building materials industry; particularly in the small-scale sector. Policy instruments that can stimulate technological capacity-building of the industry include:

(a) Fiscal policies, for example, direct tax exemption and tariff protection to small-scale industries acquiring new technologies or developing indigenous technology;

(b) Industrial policies, for example, reservation of some technologies (such as FCR technology, ferrocement technology and lime production) for the small-scale sector; especially important is the need to remove any existing bias (often unintended) in favour of large scale technologies;

(c) Technology policy, for example, incentives to labour-intensive technologies, restrictions on technology imports in specified areas;

(d) Manpower development policies, particularly, the upgrading of skills and entrepreneurial capacity in the small-scale and informal sectors, and facilitating mobility between these and the modern sector;

(e) Trade policies, through restrictions on import of capital-intensive technologies where labour-intensive technologies are already available in the country.

(f) Policies on pricing and distribution controls on building materials such as cement and roofing sheets that reduce the incentive for new entrepreneurs to acquire technologies for alternative materials;

(g) Restrictive building regulations, at local Government level, that often inhibit the introduction of innovative technologies such as stabilized soil technology in urban areas.

### 4.2.3 Facilitating Technology Transfer

4.2.3.1 Policy-makers should recognize that the process of technology development, transfer and diffusion of new technologies is generally slow. It usually takes several years from the introduction of a new technology to the point when any significant production or wide replication is achieved on a national scale. A multistage approach is, therefore, likely to be more effective; initially, simpler technologies may be acquired that require low capital investment and management capability. More sophisticated technologies should be introduced at a latter stage, preferably through the first generation entrepreneurs, who would have, by then, acquired greater capacity for absorption of more complex technologies. Special policy considerations in this area should focus on:

(a) Ways and means of improving the access of small entrepreneurs to information on new and appropriate technologies and technology suppliers; currently, such information is often heavily biased in favour of large-scale technologies;

(b) Improving the domestic capacity to evaluate new technologies concerning their appropriateness for the small-scale sector; small producers of traditional building materials have very little technical, financial and managerial capacity to seek out new technologies and evaluate their suitability through feasibility studies;

(c) Strengthening the negotiating capacity to ensure the most advantageous form of technology transfer; the small-scale sector benefits little, in terms of technological capacity, from 'packaged' technologies often transferred through aid programmes; licensing agreements should provide for training of local personnel, future upgrading and upscaling possibilities, and should allow sub-licensing to ensure wide diffusion of the transferred technology;

(d) Improving the technological capacity of the small-scale sector for technology and process adaptions to suite local materials through intra-industry transfer of information and skill from the modern sector; incentive schemes designed to promote sub-contracting arrangements could be a useful instrument for this purpose;

(e) Stimulating an "innovation" culture in the construction industry by providing incentives as entrepreneurs to engage in "incremental" technological development on a continuing basis; such incentives can take the form of direct or matching grants, recognition through rewards, tax concessions etc.;

### 4.2.4 Restructuring the Role of Public Housing Agencies

4.2.4.1 National Institutions play a crucial role in translating the policy initiatives of the government into programmes of action. The institutional support is important both for housing delivery (management of programmes & improving access of people to housing resources) and production of basic inputs like building materials and components.

4.2.4.2 It may be examined and seen that the objectives of some public agencies already permit them to play the role of facilitator, while in other housing development agencies there may be a need for suitable amendments in the statutory provisions governing their working . In cases where statutory provisions enable the housing authorities/agencies to play the role of a facilitator, it is necessary to specify that the overriding objectives of the agency will be to acquire and develop land, liaise with financing institutions, encourage production of building materials from local resources and small/medium enterprises, impart technical skills and guidance, and strengthen community action groups to facilitate shelter production and delivery. One of the important roles of such agencies should be to regulate the activities of private developers who have in past been largely operating in the highly speculative land market of large cities without any long term commitments to development of housing particularly for low-income and disadvantaged groups.

4.2.4.3 One of the major areas of intervention of national Plan of Action should be institutional restructuring. While evolving institutional frameworks following priority areas require special attention;

i) It is necessary to promote specificity of role of different agencies by giving specific tasks such as to acquire and develop land, help to liaison with financing institutions, promote production of building materials, impart technical skills, develop appropriate professional cadres and strengthen community action groups operating in human settlements sector.

ii) The work of agencies needs to be structured into appropriate divisions to form the link between people and the state. These could be Land Assembly and Development Division, Building Skills and Technology Division, and Community Development and Technical Support Division.

iii) The staffing pattern of agencies needs to be radically changed for building up the facilitator role. A large component of staff could be from disciplines related to the areas of community development, finance, estate management, planning and design. In addition, attitudes towards housing at all levels also require a radical change.

iv) Sufficient attention would need to be given to appropriate skill development, re-orienting technical education and undertaking staff training programmes, in view of present limitations of managerial and technical personnel dealing with shelter delivery programmes.

v) Intensive interaction between agencies and between different departments in the same agency is required for realising a multi-dimensional way of functioning as required in a facilitator's role.

vi) There is a need for governments to focus on function of policy formulation and planning including building up a data and information system, policy planning, formulation of alternative solutions, and evaluation. It is necessary that one single agency is given the responsibility to organise, regulate and implement the planning and policy function.

vii) Special institutional mechanisms would be required for rural housing programmes. These may be implemented through district administration and should be linked with the provision of social and physical infrastructure. It is also important that there is consistency of terms and conditions between shelter programmes for the same target group in different schemes.

### 4.2.5 Strengthening Institutional support for building materials

4.2.5.1 Institutional functions related to building materials industry are essentially inter-related, and any missing link will hamper efforts for the capacity building of the industry. In reality, however, the institutional capacity to carry out these functions vary over a wide range from country to country and is usually distributed in the number of institutions located both within the building materials sector and outside. Important steps in strengthening institutional support to the industry will include:

(a) Reviewing the functions of the existing institutions and ensuring that all essential support functions (enumerated below in Paras under 4.2.5.2) are already being provided by them; often it will be more cost-effective to incorporate missing functions in one or more of the existing institutions rather than creating a new one;

(b) Promoting structural linkages among the national institutions engaged in capacity-building in the building materials industry so as to ensure coherence in their approach and to avoid duplication in their efforts, optimizing the use of scarce resources;

(c) Reorienting the programmes of the institutions specifically focusing them on the technological needs of the industry, particularly the small-scale sector; often this will call for attitudinal changes and retraining of the scientific and technical staff;

(d) Increasing resource allocations to institutions, on a selective, result-oriented basis, to improve the impact of their support services on the industry.

4.2.5.2 There is need to examine if necessary functions with regard to development of building material production are being effectively handled by existing institutions in each country to identify need for strengthening, restructuring or establishing new ones. Broadly, four types of institutional functions can be identified relevant to the development of building materials industry: (i) technology development, including adaptation of imported technologies to suit local environment, (ii) manpower development, to upgrade the techno-managerial capacity of the small entrepreneur and the vocational skill of the operatives, (iii) industrial extension services such as assisting the entrepreneur with information and evaluation, and in the acquisition of new technologies leading to the establishment of production facilities, (iv) extending financial support (venture capital, term loans, incentives) for technological upgradation; and (v) standardization, to consolidate the gains of the technology acquisition.

**(i) Technology Development**

Specifically, technology development institutions such as research, development and engineering (RD&E) institutions can improve the effectiveness of their support to the industry by:

(a) Increasing industry-sponsored research; increase in contract research will also reduce the necessity of financial support from the Government and improve the industry-orientation of these institutions;
(b) Promoting co-operative funding and administration of research and development programmes jointly by the Government and the industry; and
(c) Strengthening design and engineering capabilities of these institutions to assist the industry in commercializing new technologies through product development and engineering, pilot plant investigations, production trials dealing with start-up problems etc.

**(ii) Manpower Development**

Manpower training for the small-scale sector in the building materials industry will be more cost-effective if such activities concentrate on a problem-solving and result-oriented approach rather than on general skill-upgrading programmes. The following considerations should guide the training programmes:

(a) Designing skill-training programmes to improve the productivity of traditional operatives in the small-scale and informal sectors by introducing improved tools and simple mechanisation and techniques;
(b) Incorporating in-plant training provisions for a sufficiently large number

of operatives in all technology transfer programmes;

(c) Deliberately including a training component in all stages of development. transfer and diffusion of new technologies;

(d) Training entrepreneurs on functional management of new technologies, particularly for those which introduce additional complexities in quality control, inventory and stores management, marketing etc.;

(e) Developing consultancy skills for extension service officers in support institutions, with particular emphasis on attitudinal aspects.

**(iii) Extension Services**

In most developing countries, institutional inadequacies to provide essential extension services to the vast number of enterprises operating in the small-scale sector pose a major constraint to technological upgrading of the building materials industry. To overcome this constraint, industrial extension agencies should:

(a) Work in close co-ordination with other support agencies, particularly, RD&E institutions and appropriate technology (AT) development organizations to provide the range of extension services required by the industry; linkage among these agencies will promote specialization and improve cost-effectiveness and quality of their services;

(b) Improve the access of small entrepreneurs to these agencies by promoting industrial co-operatives, bringing together similar group of enterprises; industrial co-operatives can be particularly effective for the technological upgrading of micro-enterprises operating in the informal sector;

(c) Concentrate on more significant sectors of the industry, depending on local resource endowments and marketing possibilities; spreading too thin their limited capabilities usually reduce the impact of extension services.

**(iv) Financial Support Institutions**

Governments can improve the availability of venture capital for technological upgrading of the small-scale producers by

(a) Encouraging commercial banks to adopting some of the positive features of the informal sector (such as flexible collateral requirements, low transaction Costs 'single window' operations etc.) in extending credit to small entrepreneurs;

(b) Encouraging development finance institutions to providing incentive schemes to commercial banks such as credit guarantee schemes, rediscounting facilities etc. for granting 'risk-bearing' loans to entrepreneurs acquiring new technologies;

(c) Establishing special funds or venture capital organizations for advancing investment funds to entrepreneurs on concessionary terms;

(d) Facilitating foreign-exchange allocations for acquiring equipment and ancillaries required for technological upgrading of production facilities.

### 4.2.6 Rationalising Norms, Standards, Regulations,

4.2.6.1 Norms, standards, regulations and planning procedures, though basic regulatory instruments, should not be used only as control measures but should provide guidance to all concerned with a view to create a climate for investment and innovation in the shelter process. In this regard regulations and standards would have to be made more affordable and user friendly and at the same time to ensure acceptable quality of life. One effective method could be to evolve a set of building standards with scaling down of procedures in proportion with the kind of use, size of construction and nature of materials used. It is also necessary to ensure that building regulations do not restrict the use of appropriate and innovative building materials. Standardization is a valuable means of technology diffusion in the domestic industry. However, unrealistic standards (often imported with 'packaged' technologies) that do not reflect the domestic capacity can hamper technological upgrading of the building materials and construction sector in particular. Governments can strengthen the role of standardization in technological capacity-building of the building materials and construction industry by:

(a) Promoting active collaboration between the national standardization agency, RD&E institutions and the domestic industry; revision of existing standards should be a continuing process linked to the growth of domestic technological capacity; national drafting groups should be set-up including planners, producers, designers, contractors, users and not just researchers.

(b) Prioritizing areas requiring standardization within the building materials and construction industry. Since standards also offer the best way to induce the use of affordable local low cost materials and techniques having demonstrated their feasibility and adequacy, prioritisation may counter balance indiscriminate use of costly modern materials and methods.

(c) Promoting the introduction of certification schemes for wider use of building materials conforming to national standards. Also intensifying educational and demonstration means highlighting feasibility of innovative materials and products.

(d) Supporting RD&E institutions and industrial extension agencies in disseminating information on new standards and their implementation to small entrepreneurs. Some of the standards need to be reformulated in terms of codes of practice, technical guides, manuals in a language and illustrative formats so that these are readily understandable by less-educated construction related people.

### 4.2.7 Strengthening Participation of Private Sector, NGOs and Community based Groups

4.2.7.1 An enabling strategy, should strengthen efforts of governments for capacity building, institutional development aiming at enhancing the roles of all key actors in shelter process-particularly private sector, cooperatives, community based organisations, and NGOs. Formulation of a suitable strategy for optimising resources and capabilities of these groups will largely depend on human resource development institutional reform, organisational and management development and continuous training and capacity building at different levels. This can be achieved by sharing of experience at national and international level and by networking activities of capacity building institutions (which in a country specific situation may themselves require strengthening) which must receive high priority in policies of national governments in developing countries.

4.2.7.2 In building materials and construction sector also, in many countries the bulk of local building materials production takes place in informal sector using rudimentary and inefficient technologies, ignoring standards and legal procedures governing formal sector activities. The strategy should, therefore, focus on upgrading and expanding the activity of informal sector both in material production and construction services (of small contractors, artisans groups etc.) and help in improving its productivity and financial viability by giving them proper technological guidance and facilitating their access to bank loans and other credit institution's supports. National strategies, likewise, need to identify means to increase the role of the private sector in the production of building materials by creating an environment conducive to increased investment through appropriate fiscal incentives. In India, for example, Central Government has exempted excise duty on a large number of building materials and components which can be produced by using wastes and by-products from industry, agriculture and can substitute use of wood in building and housing. This has generated lot of entrepreneurial activity in private sector.

### 4.2.8 Increasing access to housing finance, land, appropriate building materials and technology

4.2.8.1 To improve access to resources attention needs to be paid to removing shortages, keeping the prices at reasonable levels and promoting appropriate strategies of production, mobilisation and allocation.

i) Advanced programme of land assembly related to identification, acquisition and development of project sites is suggested alongwith a land allocation strategy favouring low income economically weaker section.

ii) At level an Urban Land Management Unit may be set up to deal with the inter-institutional problems in relation to land assembly and development. Funding agencies also need to restructure their lending pattern towards large scale land development rather than for construction.

iii) Rules, regulations and legislations with respect to land need to be suitably amended for making land available at the time when it is required. One of the ways of increasing land supply is to guide private land development through techniques such as guided land development, plot re-constitution and land sharing.

iv) Public sector agencies should be encouraged to play the role in acting as intermediaries between financing institutions and people in identifying beneficiaries, advising households on financing packages, and in promoting cost recovery at community level. As far as possible, finance flows should be according to the affordability to ensure timely repayments and therefore, recycling of funds.

v) The creation of production and marketing centres for low priced building materials and low cost sanitation systems is considered to be an important task. It is recommended that building centres are set up as gross-root support mechanisms to promote skill development, material production and marketing at local level.

## 4.3 INTERNATIONAL ACTION

### 4.3.1 Cooperation among developing countries

The wide divergence of domestic technological capacities among developing countries in Africa and, at the same time, similarities of factor proportions in their production facilities, common problems faced by these countries as a result of exogenous economic factors, and the valuable experience gained by some of the developing countries (in Africa and other regions) in acquiring technology from the international market, provide for many opportunities for subregional cooperation. There are many existing mechanisms for such cooperation in existence, which need to be strengthened and should be effectively replicated elsewhere. Some of the most important areas where such cooperation should be enhanced are: (a) regional networks for the exchange of information relating to new technologies and materials; (b) development of common guidelines for the selection and acquisition of technologies from the international market, based on the shared experience of developing countries; (c) sharing of research, development and engineering facilities in regions and sub-regions to maximize the utilisation of scarce skill and equipment; (d) sharing of expertise in raw materials prospecting, particularly between resource-surplus and resource-deficit countries; (e) developing regional and sub-regional standards and specifications for local building materials, to avoid repetitive national endeavour; and (f) the establishment of regional training programmes on small-scale building materials production processes, also for the development of technical and management skills for men and women.

### 4.3.2 Cooperation between industrialised and developing countries

South-South cooperation will complement, but not replace North-South cooperation which can provide appropriately targeted development finance, improved technology, and technical expertise to help developing countries enhance their supply of appropriate building materials and technologies. While the emphasis will be on the transfer of appropriate technologies to developing countries, attention needs to be given to building up domestic technological capacity in these countries. North-South collaboration, therefore, needs to increasingly focus on: (a) promoting the rapid transfer of newly developing technologies in building materials production, especially those which involve energy reduction in existing processes, development of new low-energy materials and insulating materials, utilisation of industrial and agricultural wastes, and pollution abatement; (b) helping to strengthen the design and engineering capabilities of national building research institutes in the areas of product and process development, pilot-plant studies and technology adaptation; (c) supporting the activities of national and international appropriate technology groups and other NGOs in the development, transfer and diffusion and cost-effective technologies; (d) promoting industry-to-industry links for small industries in the building materials sector between industrialised and developing countries; and (e) encouraging the flow of development finance from bilateral and multilateral sources to human settlements projects in developing countries which incorporate development of construction industry.

## CHAPTER - 5

## POINTS FOR CONSIDERATION AND AGENDA FOR ACTION

### 5.0 POINTS FOR CONSIDERATION BY THE CONSULTATION

Despite efforts made by developing countries during past couple of decades to improve living conditions the shelter situation has been deteriorating in most countries specially for lower income population in urban and rural areas. Faced with increased demand coupled with the decline in the supply and quality of traditional materials and techniques, many governments in African region have, in past, sought to make good the deficiency by establishing large-scale plants (imported from abroad) for production of basic building materials. Within a short period, many of these factories were faced with numerous difficulties arising mainly from the choice of technology which forced continuing dependence on import of factor inputs, spare parts and machinery etc. Economies of scale were rarely achieved in these large scale production facilities. Thus, the price of the materials produced by such plants has always been higher and failed to meet the need for affordable building materials. On the other hand, small-scale industries working on traditional production processes which are wasteful of raw materials and energy and suffer from diseconomies of scale, have also been stumbling block in improving productivity and reducing production costs.

In view of the above extreme situations appropriate technologies, intermediate in scale, which combine the advantages of small-scale technologies with scale-economy of larger-scale technologies need to be considered. This approach has been successfully tried in several countries. Lessons can be learnt from such experiences.

It is in this context the consultation may consider the following issues for discussion:

5.0.1 Will following strategies help in improving the supply of appropriate cost-effective building materials and construction technologies for enhancing shelter production in least developed countries of African region.

i) Support the enabling concept for shelter production.

ii) Target the lowest income groups both in urban and rural areas on a priority basis.

iii) Support upgradation of traditional building materials and construction methods and harness new technologies to improve productivity, quality and speed in shelter delivery programmes.

iv) Minimise overall adverse environmental impact by encouraging environment friendly building material technologies.

v) Encourage contribution and participation of local communities in the shelter process and support activities of private and informal sector. Institutional mechanisms for technology transfer should be set up at the grass root levels *(as the Building Centres programme is being operated in India on a country-wide basis or the house support centres of Zambia and South Africa)* to promote appropriate materials and construction techniques in different geo-climatic conditions to help in the local shelter construction process. These local institutions would undertake information dissemination and demonstration on

new appropriate technologies and advise local communities on aspects planning, design and construction.

vi) Create an apex organisational setup to operationalise an integrated approach for improving efficiency and productivity of construction sector. This should function as a nodal agency for the growth, development, modernisation and professionalisation of construction industry as a whole.

vii) Initiate where non-existent and strengthen where existing, efforts for research and development in developing new building materials from local resources and develop appropriate innovations in architectural, engineering, design and better management and organisation of construction activities.

viii) To augment availability of building materials based on local resources, survey of local natural raw materials and industrial and agricultural/forestry wastes (capable of being converted into building materials and products) in respective countries need to be carried out to facilitate information on resource availability and environmental constraints to their exploitation. A suitable programme on regional basis encouraging cooperation amongst the countries should be formulated to help in establishing a database on the availability of local resources and their characterisation and then to develop time-targeted projects on R&D, prototype plants and selection of sustainable manufacturing technologies for appropriate materials and products using upgraded local skills and local infrastructure.

### 5.0.2 ACTION AT NATIONAL LEVEL

5.0.2.1 Will following measures help national governments to facilitate expansion of domestic capacity for production of building materials locally and adaptation of new technologies to meet the needs of shelter for all.

i) Creating a favourable climate for enhancing technology status and productivity levels in the construction related domestic enterprises through necessary modifications in the policies of sectors like energy, environment, industry, trade, employment, and by evolving suitable systems of pricing and distribution and fiscal incentives for the sector.

ii) Strengthening the existing institutional framework to assist the construction industry capable of undertaking industrial extension services, extending support to small scale and informal sector enterprises by improving their access to new technologies through training, and facilitating procurement of raw materials and marketing supports.

iii) Facilitating the access of building material producers to formal institutional credit on flexible terms to meet their investment and working capital needs.

iv) Initiating policies for creating partnerships between domestic enterprises and those from other developing countries through joint ventures to improve capacity and capability of domestic construction industry to meet the varying needs of housing for different segments of population.

v) Introducing a flexible and forward looking regulatory mechanism based on standards, codes of practice and specifications to facilitate adoption of innovative

cost effective building materials and construction techniques in practice. A suitable system and institutional mechanism will be required to identify, evaluate and validate appropriate new technologies which could be promoted and adapted in the local construction practice.

vi) Encouraging those construction techniques which permit minimisation in the consumption of industrially produced materials and permit use of locally produced cost effective alternate materials. Thus formulating policies for giving financial support and fiscal incentives to stimulate investment in the production of innovative building materials should also be formulated and adopted.

### 5.0.3 INTERNATIONAL COOPERATION

5.0.3.1 Will following programmes of cooperation amongst developing countries in Africa or from other regions enhance the domestic capacity of production of building material, and adaptation of cost effective construction technologies.

i) Formulation of a national construction technology policy to meet the needs of construction technology development of the respective countries. This would require sharing of experience and expertise in such areas as:

a) setting up of industries for producing building materials and components in small and medium enterprises by applying new process technologies or by upgrading technology of existing enterprises;
b) setting up of industries for producing simple equipment and machinery required to apply new technologies and other technical supports required by such production units;
c) setting up of institutional mechanisms for financial assistance schemes, distribution centres and supply on credit terms through which construction enterprises can obtain these equipments and machineries;
d) setting up of training and demonstration facilities for construction enterprises to gain knowledge about the effective usage of new technologies, new equipments, and management methods.

ii) Promoting regional cooperation to widen the market for industrially produced building materials particularly at large scale manufacturing units, covering materials like cement, iron & steel, galvanised iron & aluminium sheets, glass, plywood, and boards, etc. since establishment of such large production units may not be economically viable in every country.

iii) Creating channels for seeking assistance and establishment of institutional mechanisms both among developing countries and between industrialised and developing countries for the exchange of knowledge and experience in research and development, training and legislation, setting up of techno-legal regimes with a view to strengthening institutional support to building materials and construction sector.

### 5.0.4 ROLE OF INTERNATIONAL AGENCIES

5.0.4.1 Will support from the international community and assistance agencies for national initiatives in developing countries on the following lines enhance capacity of domestic construction industry for speedy shelter delivery systems.

i) Establishment of short and medium term programme of activities including funding support to explore commercial potential of appropriate building materials and construction technologies by encouraging cooperation among developing countries.

ii) Providing assistance in increasing flow of development finance from bilateral and multilateral sources for speedy development of building materials sector in selected areas.

iii) Establishing programme of cooperation between African and Asian countries to increase the flow of know-how on new material and construction technologies which have been the subject of research and demonstrated their capacity for adaptation in other countries of the African region.

iv) Promotion of research and development of new materials and construction methods based on the use of local mineral resources, organic and vegetal fibres, forestry and agricultural residues, mining and industry wastes and by-products to facilitate development of cost effective building materials and components for housing construction.

v) Establishment of programmes and mechanisms to stimulate, monitor and coordinate technological cooperation relating to the strengthening of domestic building materials and construction industry for meeting the needs of housing and building.

vi) Support for dissemination of information through preparation of handbooks, manuals and technical guidelines on various aspects such as production of building materials, adoption of newly developed and proven construction methods and systems and compendiums on various types of appropriate technology.

vii) Extending assistance to governments to formulate appropriate materials and building standards, regulations, supporting of construction technologies development and dissemination for wider application.

viii) Establishment and strengthening of construction related research centres. These centres to cover activities such as; (i) relate their R&D work to national developmental priorities, (ii) seek to increase contract research, (iii) endeavour to improve their links with the industry, and (iv) widen the scope of their activities to incorporate all aspects of technologies.

ix) To support training programmes and demonstration projects for construction managers either within the countries or outside for familiarising with the methods adopted else where for efficient management of housing programmes particularly aimed at housing needs of the poor and low income groups.

## 5.1 AGENDA FOR ACTION : STRENGTHENING OF DOMESTIC CONSTRUCTION INDUSTRY

Though the strategy and plan of action should emerge from the discussions and consideration of the issues proposed under the section on 'Points for Consideration' in the foregoing. However, in view of several common characteristics and the country situations obtaining in most LDCs in Africa, an agenda for action is presented below in

the form of prioritised list of activities that need to be undertaken at various levels.

### 5.1.1 STRENGTHENING AND RESTRUCTURING OF CONSTRUCTION INDUSTRY

The provision of infrastructure and services together with housing is the key to future development. Yet, the low level of investment in the construction sector and the continuing dependence on imported technology and materials in many developing countries not only adds to cost of development but hamper the progress in shelter and infrastructure sectors. Urbanisation and development itself creates new needs for low-cost houses. Abundant labour force coming from less developed areas do settle in urban slums and squatter settlements. In a situation like this, the building industry proves to be a key sector for development. On the other hand role of civil engineering infrastructure works in broader development is already accepted. Thus, the entire construction industry is increasingly considered as a fundamental instrument for development. The transition from a public sector to a market system which is common to most countries, further entails the complete restructuring of the production system of the construction industry.

Networking, and the sharing of information and experience on shelter policies in different countries have grown over the last few years at local, national and international levels, however, successful approaches are yet to be adopted by planners in most countries. There is a need, therefore, for strengthening the existing Network of African Countries on Local Building Materials and Technologies comprising currently Cyprus, Ghana, Kenya, Malawi, Malta, Mauritius, Sierra Leone, Uganda, Tanzania, Zimbabwe. The Network needs to be widened by stimulating other countries in Africa particularly LDCs to join it and participate actively in the Network activities. Participatory or action research is the most effective tool for enhancing policy supports and industrial structure of the construction sector to enable it to meet the needs of housing and human settlements. It needs to be realised that construction industry (with building materials as its sub-sector) which plays a critical role in improving the implementation of housing and infrastructure programmes has to be strengthened by raising its productivity, efficiency, quality and speed. In order to implement this, if considered appropriate by the Consultation, country-specific restructuring and strengthening strategies would have to be evolved by respective countries in the region. Each country will be required to analyse trends in construction industry's output and productivity, for their specific situations, and create appropriate linkages between construction industry productivity, desired pace of technological innovation, professional training and research needs and capital investment required.

There are three areas of critical importance in order to improve capacity of construction industry to enable it to address the needs of housing and related infrastructure in the developing countries. These three comprise the basic programme elements of strategy for strengthening and restructuring. The first concerns TECHNOLOGY MANAGEMENT which should be focussed on national efforts and international technical assistance aimed at developing the basic technological infrastructure at the sectoral and enterprise level. Second is the issue of IMPROVING FINANCIAL BASE and improving the access to credit for efficient performance of construction industry activities. The third refers to the TECHNICAL COOPERATION AND ASSISTANCE ACTIVITIES extended to the respective countries of the region for undertaking time-targeted programmes of restructuring and strengthening the domestic construction sector.

### 5.1.2 TECHNOLOGY MANAGEMENT

Management of technological change is the most vital component for any programme of strengthening and restructuring of an industrial sector. It seeks a response to a series of issues which include; (i) technology utilisation to increase productivity, quality and cost-effectiveness, (ii) identifying and predicting technology trends in the country, (iii) How to use technology to maintain and strengthen competitive advantage of enterprises and how should enterprises organise themselves in order to promote technological innovation, (iv) Which technologies should enterprises command for purposes of competitiveness, growth and profitability, (v) When should an enterprise acquire and discard technologies and how can this be done rapidly and effectively, (vi) capacity to evaluate and validate technologies effectively for commercial exploitation and wider application, (vii) How to reduce the lead time for the development of new products and services, (viii) How to enhance the contribution of technical expertise at the enterprise level, (ix) How can the linkages between all the organisations/agents of the technological development infrastructure and the enterprises be strengthened in order to promote technological innovation by speeding up technology diffusion.

Under a national programme of industrial strengthening and restructuring technology management should be conducted at the three levels i.e. at **regional level** (intra country) to ensure appropriate institutional framework for technological education, research and development and the transfer and incorporation of technologies; at the **sub-sectoral level** to develop strategies and priorities which will enable building materials and construction sub-sectors to upgrade design, innovation and quality capabilities by promoting specialisation in order to meet the critical needs of the local markets, and finally at the **enterprise level** aiming at generating capacity for absorbing new technologies and stimulating technological innovative aptitude to improve products, quality and marketing.

#### 5.1.2.1 Dissemination of Information, Awareness Creation and Confidence Building - Action at National Level

Appropriate technology and its selection, is a long debated issue which also has consequences on the construction. Because of high diversification of the construction industry, there is always more than one appropriate technology for building product. Similarly the geographical or geo-climatic character of the targeted building products (which may be spread over different regions in a country, and nature of transportation network, that a country has) influences the selection of technology. The third aspect of imported technology, which should be compatible and technically feasible at all levels of 'installation', 'operation', 'maintenance', 'production', and 'repair' by mean of locally available or easily imported skills, services and materials. Then appropriateness of a technology should also be examined for its 'national cost' which should be calculated on the basis of real costs - which means real rate of exchange of foreign currency, the real rate of interest and realistic labour wages. Thus there is a need to carry out a cost/benefit analysis. Finally the true social costs should also be taken into account which may not coincide with the actual market prices such as, the cost of environmental impact, renewability of resources or economic consequences of abrupt increase in unemployment. Thus in view of such hidden costs appropriate interventions may be needed.

In view of the above aspects involved in selection of appropriate technologies for country specific situations the need for information dissemination for awareness and

confidence building is significant. Following actions are recommended for consideration:

i) Information to be disseminated on construction technology relevant to specific geo-climatic regions and dissemination should be extended within the network of African countries on building materials and technologies to cover aspects other than materials and techniques.

ii) Technology demonstration., prototype and pilot plant projects should be established for creating confidence in cost-effective technologies. Use of selected proven technologies in the construction of civic/community buildings both in urban and rural areas will create high visibility examples and help in building confidence and acceptance of new technologies.

iii) Technology Management and Industrial Information Centres should be established at national and sub-regional levels. At the country level these can be located suitably with National Coordinator for the Network of African countries where the country is a member already. Such centres will cater to the needs of evaluation and selection of appropriate technologies in close collaboration with the enterprises and would also provide support services required for management of technology and industrial information, sourcing of suitable technologies, arranging professional consultation and training by identifying technology requirements of enterprises. Thus these centres by working with the building material and construction companies will help in planning and creating the desired conditions for successful technological innovation covering evaluation, selection, negotiation, adaptation, incorporation and improvement of exogenous technologies as well as internal innovation capacity development. The establishment of a technology management and industrial information centre should be given priority in national action plans for development of construction industry. The centre would utilise enterprises' experience as a tool for demonstration and transfer of technology and would also serve as an interface between the science and technology infrastructure of the country and the enterprises at the field level.

iv) Strengthening of linkages between productive sector and scientific and technological infrastructure should be taken up at national level by formulating adequate policies before a broad based industrial restructuring and strengthening programme can be taken up in a serious way.

### 5.1.2.2 Technical cooperation to Support Strengthening of Construction Industry

Today all countries are moving towards economic liberalisation policies and programmes. Such programmes require restructuring of NGOs, industry and trade associations and industrial enterprises. Induction of new technologies, professional management practices and information systems will be essential for raising the productivity, efficiency and cost-effectiveness. The enterprises operating in an industrial sector will require support services in the area of access to technology, raw material procurement, quality assurance, enhancing productivity, training of professionals, marketing and management. Self employment and entrepreneurship amongst women is being increasingly recognised. Women entrepreneurial groups exists in the several African countries more particularly in Nigeria, Zambia, Kenya, Sudan and Ghana. The Economic Commission for Africa (ECA) has taken the initiative of bringing women entrepreneurs under the umbrella of African Federation of Women Entrepreneurs.

Technical cooperation in this area has to address both the programme or project related aspects and promotional activities which cover investment and technology.

### 5.1.3 IMPROVING FINANCIAL BASE

Housing finance is a critical input into the shelter process. Like land, housing finance is also an extremely difficult area to reform and improve. Housing finance institutions in most developing countries serve the conventional markets but fail to respond particularly to the needs of low income shelter. To strengthen the financial system for efficient housing delivery it is necessary to integrate housing finance systems, in respective countries into the national financial systems. This would enable to meet the needs of low income shelter by reconciling the three partially-conflicting objectives: affordability to borrowers (specially to low income borrowers and in the construction industry to small and tiny enterprises), viability to lenders (finance institutions, public institutions and others find it difficult to offer loans to low income families and producers of innovative building materials), and resource mobilisation for the expansion of the sector or economy as a whole.

There could be four ways of increasing the supply of housing; (a) development of housing finance systems linked to household savings thus facilitating housing finance to low income household, (b) development of local housing finance systems thereby shifting roles of central finance organisations operating in the formal sector of housing finance, (c) financing of rental housing production, and (d) strengthening financial base of construction and building materials industry to meet the rising demand of building materials and construction systems from different sectors. In the context of the present study the last of these options i.e. improving the financial base of the construction industry is dealt in following paragraphs:

Financing the development of construction industry is one of the key variables in promoting economic growth. This calls for addressing the weaknesses in the national development financing structures and systems of financial intermediation. It will consequently need to review the main issues relating to the role of financial services sector in channelling finance to the productive sectors. The restructuring programmes of construction sector will have to take into account the relationships that exist between financial intermediaries and enterprises. Such an analysis will help in evolving country specific strategy for modernisation of the financial services available to construction industry and its obligatory role to cater to the decentralised needs of housing market. The goal of the restructuring financial system should be to make available adequate resources at the disposal of an efficient system of financial intermediation which in turn should meet credit needs of different segments at reasonable cost. In order to meet the improvement in the construction sector (which mainly consists of small scale units operating in formal and informal sectors) a well thought out strategy of restructuring of the financial systems and financial intermediaries should be undertaken to cover the activities of development banks, commercial banks and related non-banking institutions. This would require a thorough evaluation of structures and supervisory and regulatory policies of the system as a whole.

At the level of projects and enterprises credit allocation, concepts and practices by financial institutions is crucial for (a) expanding capacity, (b) technology development and upgradation, (c) joint venture through import of technology, (d) project identification, preparation, appraisal and implementation. Small enterprises in building materials and construction sectors have generally low credit worthiness. This is because that these

enterprises particularly borrow capital based on innovative products, process technologies either imported or developed at R&D institutions and thus they are bracketed with high risk enterprises having both technological risk and financial risk. In some countries, a variety of smaller credits and funds are available but it has been noted that these resources are insufficient to cover the financial requirements of construction activities and the sector needs financial strengthening.

#### 5.1.3.1 Measures for Financial Strengthening - Action at National Level

Success of industrial restructuring programme will largely depend on modernisation of the financial services and efficient functioning of intermediaries. Financial reforms should aim at : modifying financial protection structures; liberalising interest rates and stimulating domestic savings; improving competition between the state and private sector banks; introducing innovative banking institutions to meet the needs of large size of informal sector. In the context of proposed strengthening of construction industry in different countries, following actions are recommended for consideration of the consultation:

- There is a urgent need to generate additional domestic savings, identify alternative sources of bilateral and multi-lateral external finance and improve effectiveness of resource allocation.

- The concentration of available financial sources in a special national fund for industrial restructuring could be considered. Such a fund can be operated either by the Central Bank in the country or through various commercial banks available in a country.

- To strengthen information and data base on various aspects of macro-economic and sub-sectoral performance and growth trends in construction sector for efficient analysis to be undertaken by financial intermediaries.

- There is a need to augment the financial resources for technology upgradation of the enterprises and for other aspects like; support for project identification, preparation, appraisal and implementation.

- Techno-financial feasibility studies should be undertaken indicating indepth analysis of the suitability of a production process and appropriateness of a technology having clear market potential for innovative building materials and construction technology projects to facilitate proper consideration by financial institutions for extending loan support etc.

- The national level Technology Management and Industrial Information Centre should be set up to identify proven technologies and delineate guidelines which could be considered while providing financial and technical support services by the financial and banking institutions. The Centre should also be entrusted with the task of formulating projects requiring technical cooperation with other countries or financial assistance from international agencies.

### 5.1.4 TECHNICAL COOPERATION & ASSISTANCE - ROLE OF UNIDO

In the above context, the technical cooperation programmes need to be supported by United Nations Industrial Development Organisation to cover areas such as investment and technology support at national and regional levels. First priority should be given for

establishing a programme/project on the management of technology and information for strengthening and restructuring of construction industry, including sub-sector of building materials. As can be seen from the existing trends of stagnant technological upgradation and lack of innovation for improving productivity in the construction industry following recommendations are offered for establishing cooperation programmes amongst the developing countries and assistance from international agencies.

a) Case studies of construction industry in a variety of developing countries of African region should be undertaken to assess trends in construction productivity and cost-effectiveness with a view to evolve performance parameters/indicators to take care of the rising demand of housing units.

b) Study should be undertaken to establish appropriate technologies which can be utilised to increase productivity and quality of construction enterprises. Case studies also need to be undertaken to determine the extent to which prefabricated and manufactured building components and the appropriate level of prefabrication based on local raw material resources that can be adapted for use in LDCs in African region. UNIDO should help in evolving action plans for improving construction industry productivity and cost effectiveness in selected countries. where the national governments are interested, a full programme should be undertaken for strengthening and restructuring of construction industry particularly in the context of improving housing delivery. Policy supports with adequate financial backup should be created to intensify the production of innovative cost effective construction materials and techniques which are:

- currently adapted to real technical requirements and economic resources available;
- based as much as possible on local raw material resources and skills;
- scientifically conceived, tested and validated;

c) UNIDO should encourage and establish bilateral and multilateral cooperation programmes to extend support in terms of the following initiatives

i) Opportunities should be offered to countries in the region to share information and experience of common interest. The countries in the region should take initiative by proposing such technical assistance and cooperation programmes and projects.

ii) Extend financial assistance to undertake studies to strengthen construction industry data covering the aspects of performance, changing trends, rising demand, educational and R&D needs of the domestic construction sector. A sample project is indicated in *Annexure-IV.* Detailed project proposal for cooperation between developing countries of Asian and Africa has been earlier submitted to UNIDO.

iii) Assist governments of countries in the region in creating national coordinating apex institutions for construction industry and offer possibility of a network for information exchange on regional and global level. The existing Network of African Countries established by Common Wealth Science Council in collaboration with UNCHS should be taken advantage of.

iv) Encourage the setting up of joint ventures in product development, production of building materials, strengthening of training and management services and operating construction enterprises. These projects can be developed amongst the countries in the region or with other developing countries or with developed countries.

v) Support establishment of national Technology Management and Industrial Information Centre as well as in the establishment of regional network of such centres in case few existing institutions are identified to perform such activities then their activities in the area of building materials, construction techniques and design should be supported.

vi) UNIDO should work with other UN and international and national agencies to develop more appropriate building and construction standards which would facilitate use of innovative cost effective and durable building materials products and construction systems.

*Annexure-I*

## OVERVIEW ON HUMAN SETTLEMENTS AND POLICY RESPONSES IN LEAST DEVELOPED COUNTRIES IN AFRICA

The situation in respect of human settlements and the policy responses vary enormously along the spectrum of the least developed countries in Africa as indicated in following pages:

### Burundi

The country is potentially very rich in terms of the coffee plantations and the agricultural farms, but this wealth is scattered in a multiplicity of small lots which cannot withstand the rapid increase in population. 99% of the farms cover less than one hectare each, and will become smaller in the coming years. Between agriculture-based activities, and the service jobs in the capital, there are few alternatives, and the urban growth is accelerating. Faced with the imbalance in settlements, the Government is creating a network of intermediate towns, capable of checking the exodus to Bujumbura, and setting up new economic circuits for the rural migrants. The magnitude of the task of creating artisan and microenterprises in these new towns is daunting, given the lack of equipment and facilities for new petty entrepreneurs in the urban centres, and the absence of educational infrastructure.

The UNDP and UNCHS sought to assist the development of few towns through assistance to the Ministry of Housing and Urban Development and local bodies for improving urban management and the knowledge of the local staff through training and sensitisation, and facilitating the implementation of new activities. A data bank was set up, and manuals were published such as one for the grant of building licences. With greater autonomy granted to the municipalities, they could organise their staff and fiscal services, mobilise funds and start new activities. The programme has received a setback after the termination of UNDP assistance, because of local problems.

Another notable initiative was the creation of the agency for social building and land development ECOSAT under the central Ministry in 1987. The housing and urban services projects supported by the donor agencies contained a module for training for the construction of individual houses. The agency was trained to handle plot allocation plans, coordinate collective construction works and individual buildings, promote model houses, operate and use the computers for data management, and recover loan funds. Thanks to the support of the Government and UNCHS, the organisation was commercially viable, while achieving the social objective of allotment of social housing units, and assisting in the construction of units by the allottees. The organisation won the 1991 Habitat Prize. The Urban Housing Promotion Fund was spun off from ECOSAT, and it provided to access for finance to low income clients. Inspired by the pilot projects, Burundi has launched several social housing projects.

### Congo

The country is suffering from rapid population growth, rural migration to the towns, underdevelopment of economic sectors, severe unemployment, decline in real incomes of the poor, lack of infrastructure and poor public services. The state was theoretically the owner of all urban land, but had allowed the informal real estate system to operate, which left the occupants with poor services. The municipalities are in constant deficit due to the low level of tax collection, and could not maintain the highways or services, or augment them. Despite a 2% tax on salaries to boost housing development, the Real estate Promotion and Management Company was content with an yearly production of 100 to 200 high income units, which were sold to selected

persons at highly subsidised prices. The laws for the sale of land and taxation were complex. Bulk of the urban population lived in two cities, and the rest lived in administrative centres with few economic activities. Urban data was extremely sparse.

The Government has taken steps in recent years to bring together all the actors in the shelter sector on a platform shared by the donor agencies, and developed proposals for a national shelter strategy. The Real Estate Promotion Company and the Central Ministry for Housing were restructured. The practice of mixed development has been proposed in order to encourage public-private partnerships for rational land development. The services of local bodies were strengthened to handle maintenance and to coordinate shelter plans. In order to reduce the costs of shelter construction, guidelines were issued for the promotion of local building materials. A National Housing Fund was proposed to mobilise deductions from salaries, and to advance loans primarily to low income households and private investors in social housing. A National Housing Centre was proposed to gather all information concerning the shelter sector and to monitor the housing situation.

**Ghana**

Ghana is in the upper income bracket of the least developed countries in the region. However, rapid population growth and increasing urbanisation has led to a severe shortage of adequate housing for the estimated population of 14 million. The massive devaluation of the currency in 1990 and the structural adjustment package has led to reductions in public subsidies for housing, and high rise in housing costs and rents. The low income families are forced to live in congested and insanitary squatter settlements and inner cities. In Accra, the average occupancy is an amazing 38 persons per house. However, in the rural areas, the problem is the low construction quality of improvements and new additions to the existing housing stock, indicating the need for improved use of local building materials. The annual production of housing by the public agencies is minimal and is often beyond the reach of the low income groups. Since the private sector builds for high and medium groups only, the poor majority depend on informal sector housing in unregulated layouts. These informal settlements are characterised by overcrowding, poor sanitation, deteriorating physical conditions, and lack of infrastructure, and often without transport links to employment. As with other African countries, the shelter sector faces constraints relating to institutional capacity, inadequate housing finance , infrastructure, building materials, skilled personnel and data base.

The Government has formulated a National Shelter Strategy, and is implementing it through a policy of decentralised planning, administration and development at the local and district levels. Communities and local authorities are assisted to plan and execute improvement programmes at the village or neighbourhood level through community participation. Environmentally sustainable growth of Accra is promoted through strengthening local capacities to plan, coordinate and manage urban growth, improved multisectoral and community-based planning, by enhancing the availability and use of natural resources, and by reducting the exposure to natural hazards. The Policy Planning and Evaluation Unit is establishing the housing data bank, and is also conducting studies covering building materials, construction industries, rural housing, housing and non-conventional strategies.

A wide range of technologies are used in the country, ranging from industrialised techniques based on mass-produced components to labour-intensive methods using the minimum of tools, and naturally occurring materials. A hindrance to the development of large scale production of building components and the standardisation of dimensions is the lack of lack of a realistic long-term building programme of houses and other construction. Despite the availability of local building materials, the formal housing market relies on costly materials in limited supply and which are largely imported. The production plants of these materials are operating inefficiently

and at less than 50% capacity. The research institutions do not disseminate sufficient information on technological innovations which could enhance the quality of construction using local materials. It is necessary also to promote alternative materials and devise appropriate policies on tariffs, taxes and incentives for the construction sector.

The study on rural housing revealed defects in building materials and construction technologies, weak housing infrastructure, lack of policy orientation, and inattention to sociocultural aspects. It is necessary to promote district level rural housing programme, a housing credit scheme, promotion of appropriate construction skills, and encourage community participation. The study on housing finance revealed that low and moderate income groups have very limited access to credit facilities for house construction. The situation is worsened by the ever increasing construction costs and decline in real incomes. Efforts are on to promote a primary mortgage market and to extend larger loans to the poor.

The strategies for land, finance, building technologies and materials, involvement of women, flexible locally responsive procedures, improved access for the poor and community participation are being tested in a number of pilot projects. The scaling up of these approaches is expected to take time because of the overall constraint of finances and organisation.

**Kenya**

The East African country of Kenya is undertaking revision of housing policy within the context of the GSS, ongoing economic reform and structural adjustment problems. It is however buffeted by the problems of drought, influx of refugees from neighbouring countries, withdrawal of foreign aid owing to international perception of the regime, and the pains of transition to a participatory democracy from a one-party rule. With a population rate among the highest in the world, the urban population was estimated at over 6 million in 1993. Over half the urban population is in Nairobi, with Mombasa a distant second, and a number of smaller urban areas. However, the vast majority of the population of Kenya live in rural areas. Most urban dwellers have no access to basic sanitation and live in squatter settlements. Majority of low income wage income earners are working for the private sector in agriculture or forestry and adult illiteracy is high.

The human settlements sector is made up of the Ministries of Land and Housing, and of Local Government and Physical Planning, as well as the National Housing Corporation. Also included are the provision of urban water supply and sanitation through the Ministry of Water Development and Local Government, rural sanitation through the Ministry of health, and electricity by the Kenya Power and Lighting Company, while industrial development is run on parallel lines. So far, the perception of human settlements is biased towards urban areas. The formal private sector has also tended to concentrate in the urban areas on high income housing, with the informal private sector and peripheral development favouring middle income and lower income groups. The range of financial institutions is much greater than in other African countries, with five banking institutions, 30 building societies and seven insurance companies, and specialised institutions like the Housing Finance company and the National Housing Corporation.

In physical terms, between 1977 and 1983, the public, private and the informal sector produced an estimated annual average of 40,000 new units, of which the informal sector produced about 75%. In Nairobi itself, the public and private sector output never exceeded 3000 units per annum, although the city required over 12000 units annually. Over 1979-83, only, 8% of the planned low income units under the official sites and services project were completed, and cost 5 times the estimated figure. Excessively high and unrealistic standards for building design, occupancy and services contributed to this. Despite official efforts to augment serviced sites and squatter upgrading, the housing conditions continued to worsen, and the majority of unregulated settlements suffered from poor services. Water shortage threatens many growing towns. The

spontaneous housing by the poor is frustrated by periodic demolition of small scale businesses and houses on the grounds of violation of the Master Plan.

The whole of Kenya is covered by physical development Plans for the seven provinces, with identified growth centres. The policy of incentives to private industry to locate in smaller towns did not succeed, however. The National Plan outlines a national service centre hierarchy through which the government aims to reach all the population with improved services. The hierarchy consists of urban centres, market centres, local centres and rural centres, each with its own mix of services. The Department of Physical Planning guides industrial location also. However, there is a serious shortage of professional staff at all levels. In terms of allocation of funds, the tow largest cities receive a disproportionate share of the Budget, as compared to rural areas which accommodate the majority of Kenyans. Coordination in planning and implementation is also lacking, with an estimated 30 agencies being involved in settlement planning, but not related to a comprehensive strategy. The local governments are highly dependent on national government grants and cannot hope to implement development programmes.

The planning standards themselves are inappropriate to local resources and cultural needs, as well as building material availability. Despite official statements to revise the housing standards to the minimum consistent with the needs of appropriate low cost housing,Not much effort has been devoted to the revision of building codes, public health registration and town planning guidelines, many of which are still modelled on those of Europe several decades ago. It is however doubtful if public housing can be cheaper than aided self help units, and if they can meet more than a fraction of the demand.

Virtually all rural housing, and a major proportion of urban housing is done by the informal private sector. Major contract are undertaken by a few established contractors using industrialised methods. In the formal sector, there are smaller contractors who tend to use concrete blocks and other manufactured products using western designs. These two groups of operations are heavily dependent on imported materials like cement and steel, and the rising cost of these materials has been an important factor in the escalating cost of construction. The price of legal shelter has moved away from what the majority can afford. The third set of operation is largely self help construction with traditional materials.

Official policy backs self-sufficiency in construction materials, under the guidance of the National Construction Corporation. Under it, the National Construction Company provided management and financial assistance to local subcontractors, and helps develop local building material production, apart from helping some of them get contracts. The Housing Research and Development unit at Nairobi University and the Industrial and Commercial Development Corporation have been promoting the development and use of local building materials. There is a wide range of local materials like soil cement blocks that can be produced safely. UNICEF's village technology unit promotes the use of stabilised mud blocks through the training courses for teachers in rural polytechnics.The Kenyan Bureau of Standards is also looking into the revision of standards. However, the average African administrator and architect tends to disregard the local building materials, and blindly adopts western designs. Public housing projects still rely on imported materials, and municipal regulations do not encourage the use of local materials. It calls for changes in professional mindsets and technical education curricula.

Despite the huge need for funds, the allocation of funds to the shelter sector is quite low. The local authorities are not getting the maximum from rates because the levy is calculated as a percentage of the unimproved site value of the land, excluding the value of buildings and service developments. This obviously benefits owners with large structures and commercial units. The local authority premises carry rents much lower than market rents. Even as some taxes were taken over by the central government, additional functions were shifted to local bodies. The large

number of actors in the financial sector leads to fierce competition and early death of new institutions. The high mortgage rates and transaction costs and eligible criteria limit their finance to higher income borrowers. The problem for the low income families include: high administrative cost of small loans; the fact that serviced sites are not considered adequate collateral; the unwarranted fear of high default rate; rigid affordability criteria,unsuited to income generation patterns of the poor; and rigid repayment and collection practices. The proposals under consideration to reform the system include: introduction of secondary market in housing finance; diversification of the housing portfolio of pension and social security funds; introduction of building and housing levies; greater privatisation of services;

**Nigeria**

The country is today in the midst of a major civil strife, and is facing severe economic problems. There are serious lags in the provision of basic services despite the years of oil boom, and the income disparities are widening. In Lagos, the services breakdown often, there are major traffic jams, and formal housing programmes reach only a few. The rural areas receive only a small proportion of public investment. Only 7% of the housing loans of the Federal Mortgage Bank reached the low income applicants in 1990. The number of dwelling units required among low income families in urban and rural units was estimated at 32.7 million in the year 2000. The requirement of funds for the massive public housing programme alone is estimated at $43.5 billion. At the same time, recent economic troubles have led to the exclusion of housing from the preferred sector for the flow of government and bank funds.'

Nigeria's new National Housing Policy is framed within the context of the GSS, and makes an explicit mention of placing the private sector and the community at the centre of policy. The structure of housing finance is stated to be under reform, and an Infrastructure Development Fund has been set up to channel long-term low-interest funds to service provision. It has also established a National Housing Fund as a source of long term loans to the 251 primary mortgage institutions operating in the country and the urban development Bank to cater to large scale development of housing and infrastructure. The National Prototype Housing programme was started in 1994 to build 121000 housing units of various categories in 30 states. The National Urban Renewal Programme ensures tenure security for all who are resettled and priority attention is given to squatters on public land. The approval of the National urban Development Policy has strengthened the links between shelter and settlements policy.

Overcentralisation of authority of authority has not only emasculated the subnational agencies, but has prevented them from exploiting potential sources of revenue for human settlements development, or taxing beneficiaries differentially according to paying capacity. The precondition to improved flow of funds to the shelter sector is of course an improved macroeconomic climate and decentralisation of revenue and implementation authority.This will also lead to larger mobilisation of individual savings by institutions in whom public can repose greater confidence.

It is hoped that as envisaged in the new Policy, the local authorities are given the responsibility of controlling layouts, services and sanitation and support to efficient construction techniques and appropriate materials.

Despite massive public expenditures in housing, the benefits have gone to a privileged few in the major urban areas, and bulk of investment in house construction has come from the savings of individuals and informal loans. The contributions of community or town associations in financing human settlements development, especially rural areas, is remarkable. These communities invest heavily in physical infrastructure and community facilities. As yet, however, the size of tenurial security and serviced sites schemes for the poor are on a low scale although the instances of forcible relocation of squatters are on the decline. The cumbersome Land Use

Decree and procedures of land rights and acquisition require to be modified urgently under the new Policy. Similar is the need to reformulate town planning and building regulations. The Building Code and Planning Regulations demands minimum number of rooms, use of imported materials, minimum size for rooms etc., which push up the price of legal shelter. The preference of the town planning departments and the housing corporations for low density residential development increases infrastructure costs with reduced saleable land. The rent regulations lead to the dilapidation of the housing stock and private sector's lack of interest in providing new rental housing. The National Housing Policy refers to the Government's intention to augment rental housing by the employers and the public agencies, but evidence of this is yet to be seen.

**Other African Examples**

**Zimbabwe** has set up a Deregulation Committee in order to streamline regulations that inhibit the participation of participation of different actors in the shelter sector. Revised minimum standards and innovative and affordable designs for housing and infrastructure are being implemented. Private institutions, developers, NGO's, and housing cooperatives are being encouraged to engage in joint ventures with the Government in projects for land development and housing. In order to modernise the building industry, the Government has relaxed the rules regarding the import of plant, equipment and machinery. As part of the privatisation of housing, the Government is offering to the sitting tenants in public accommodation on a rent-to-buy basis, and is also mobilising external funds to promote housing development.

**Zambia** has been implementing its revised housing policy within the framework of democratisation of the political decentralisation process, liberalisation of the economy, and decentralisation of the power and functions to the local authorities. Under a specific project to promote appropriate and affordable low cost building materials and improved construction techniques, a number of demonstration houses have been constructed, and small entrepreneurs were trained and assisted to establish themselves in the community to produce low cost materials commercially. The government operated an innovative housing scheme,supported by the World Bank , through a housing support unit in the Municipal Council, and structured on community involvement in the selection of allottees, installation of services, individual housing construction with the help of project loans, and subsequent service maintenance. This led the government to assume the facilitating role in the sector, and to set up a Housing Development Fund as a vehicle for mobilising resources for low income housing. The Fund began its operations in 1990 with substantial injection of capital from the country's financial institutions.The Fund provides housing project financing and direct mortgage advances.A remarkable feature of the Fund is the active participation of the private sector and the NGO's. However, the realisation of physical targets has been hampered by the lack of leases, shortage of serviced land, and delays in the process of building approvals, showing the importance of government facilitation for the housing finance process.

**Tanzania** Government regards the provision of adequate shelter, infrastructure and services as central to both settlement development and national development. A National housing Corporation was set up to provide housing for low income families and improving housing conditions in rural areas. All buildings worth more than 100,000 shillings were nationalised with the Registrar of Buildings to manage these. The National Housing Bank was set up to provide loans for individuals,cooperatives and corporations. Serviced sites were provided for squatters after abandoning the initial policy of slum clearance. With all these efforts, however, the annual output generated by all the national institutions was hardly 3000, or one tenth of the demand. The absence of stock exchange prevented the development of a bond market in housing. The high interest rates caused by the economic crisis put housing finance beyond the reach of all but a few. However, the government's achievements in extending services in the rural areas were considerable, especially primary education, health care, adult literacy, potable water, , feeder

roads and electricity. The formal sector's dependence on imported materials and construction technology has severely hampered construction activities. The escalating costs have also affected informal sector construction activity. In order to reduce dependence on industrialised materials, the government is encouraging research in the improved use of indigenous materials, and the establishment of small scale building material units in different regions.

Tanzania is also illustrative of the inhibiting effects of regulatory policies on housing activity, such as the nationalisation of buildings, and the Rent Restriction laws, both of which dampened private sector's confidence in housing investment. The abolition of elected local authorities over 1972-78 led to the depletion of resources at the local level, and deterioration of urban infrastructure and services. it also created a climate for flouting of building regulations and for non-payment of local taxes and charges.

**Urban Land Management**

The predominant land policy instrument in many African countries, as in South Asia, was the social control of the State over urban land, either through nationalisation of all land, or through the control of all land leases. This model is being increasingly replaced by public-private partnerships in land development and servicing under the impetus of economic liberalisation and GSS. The tribal and community forms of land tenure, especially in rural areas, is also lending itself to group activity for land development and collateralisation of group tenure for raising bank finance. The limitations of public agencies for monopolistic land development and disposal are also being realised. Large pockets of vacant land are held by various public agencies in different countries, and the trend is to oblige these agencies to release this land in the market. The role of urban infrastructure and flexible land use planning in augmenting the supply of urban land is also being recognised in a number of countries.

The earlier ideological opposition to squatter settlements and their periodical removal has given way to support for their regularisation and assistance for incremental upgrading of the slum settlements. Simplified forms of grant of security of tenure and land registration are being explored,given the weak status of land title registration, and the complexities of customary land laws. The implementation of policies for the regularisation of informal settlements is seen as calling for a redefinition of the role of the State and public agencies, the organised developers and housing groups, and the strengthening of the capacity of local authorities and communities, and the creation of flexible procedures. Important in this context is the dissemination of information on land,services, and regulations to community organisations and the NGO's as a means of empowering them, and mobilising their resources. Equally critical is the revision of Master Plan approaches and planning standards.

*Annexure-II*

## COUNTRY PROFILES FOR LDCs IN AFRICA

| | Population | | GNP per capita | | Real GDP growth (annual average % change) | |
|---|---|---|---|---|---|---|
| | (mn) 1990 | Growth rate 1985-90 | 1980 | 1989 | 1981-85 | 1986-90 |
| Algeria | 24.96 | 2.9 | 1940 | 2250 | 4.46 | 0.68 |
| Angola | 10.02 | 2.8 | 725 | 620 | 0.12 | 4.12 |
| Benin | 4.63 | 3.2 | 320 | 380 | 3.72 | -0.1 |
| Botswana | 1.30 | 3.5 | 780 | 1600 | 11.7 | 8.44 |
| Burkin Faso | 8.99 | 2.8 | 240 | 320 | 4.92 | 2.96 |
| Burundi | 5.47 | 2.9 | 200 | 220 | 5.12 | 1.86 |
| Cameroon | 11.83 | 2.7 | 960 | 1000 | 9.5 | -1.7 |
| Cape Verde | 0.37 | 3.1 | 520 | 760 | 4.82 | 2.24 |
| CAR | 3.03 | 2.5 | 320 | 390 | 2.4 | 1.62 |
| Chad | 5.67 | 2.5 | 160 | 190 | 6.54 | 2.84 |
| Comoros | 0.55 | 3.1 | 344 | 450 | 3.6 | 1.48 |
| Congo | 2.27 | 2.8 | 340 | 940 | 11.16 | 1.96 |
| Cote d'Ivoire | 11.99 | 3.9 | 850 | 790 | -0.26 | -0.96 |
| Djibouti | 0.40 | 3 | n.a. | n.a. | 1.52 | 1.04 |
| Egypt | 52.42 | 2.2 | 500 | 630 | 7.88 | 2.66 |
| Eq.Guinea | 0.35 | 2.4 | n.a. | 430 | 0.5 | 2.92 |
| Ethiopia | 49.24 | 2.7 | 120 | 120 | -0.14 | 3.88 |
| Gabon | 1.17 | 3.3 | 3900 | 2960 | 1.98 | 0.92 |
| Gambia | 0.86 | 2.7 | 350 | 240 | 0.96 | 7.62 |
| Ghana | 15.02 | 3.1 | 410 | 390 | 0 | 5.36 |
| Guinea | 5.75 | 2.5 | 303 | 430 | 1.84 | 3.96 |
| Guinea-Bissau | 0.96 | 2.3 | 130 | 180 | 7.32 | 2.04 |
| Kenya | 24.03 | 4.1 | 420 | 370 | 3.62 | 3.62 |
| Lesotho | 1.77 | 2.8 | 410 | 470 | 1.38 | 6.4 |
| Liberia | 2.75 | 3.3 | 580 | n.a. | -0.9 | -6.96 |
| Libya | 4.54 | 3.6 | 9741 | 5310 | -3.54 | 0.44 |
| Madagascar | 12.00 | 3.2 | 430 | 230 | -0.78 | 2.4 |

| | Population | | GNP per capita | | Real GDP growth (annual average % change) | |
|---|---|---|---|---|---|---|
| | (mn) 1990 | Growth rate 1985-90 | 1980 | 1989 | 1981-85 | 1986-90 |
| Malawi | 8.75 | 3.3 | 180 | 180 | 3.12 | 2.68 |
| Mali | 9.21 | 3 | 240 | 270 | 1.72 | 6.6 |
| Mauriania | 2.02 | 2.8 | 440 | 490 | -0.34 | 1.5 |
| Mauritius | 1.08 | 1.2 | 1180 | 1990 | 4.46 | 6.82 |
| Morocco | 25.06 | 2.4 | 930 | 880 | 2.52 | 4.28 |
| Mozambique | 15.65 | 2.7 | n.a. | 80 | -7.9 | 3.64 |
| Namibia | 1.78 | 3.2 | n.a. | 1030 | -1.38 | 2.88 |
| Niger | 7.73 | 3.1 | 440 | 290 | 1.14 | 2.42 |
| Nigeria | 108.54 | 3.5 | 1030 | 250 | -1.82 | 3.18 |
| Rwanda | 7.23 | 3.4 | 240 | 320 | 2.4 | -0.56 |
| Sao Tome | 0.12 | 2.4 | 485 | 312 | -3.88 | 4.52 |
| Senegal | 7.32 | 2.7 | 510 | 650 | 3.04 | 2.8 |
| Seychelles | 0.07 | 1 | 2000 | 4170 | 1.72 | 5.34 |
| Sierra Leone | 4.15 | 3.6 | 320 | 220 | -0.6 | 0.44 |
| Somalia | 7.49 | 2.4 | 140 | 170 | 3.5 | 1.18 |
| Sudan | 25.20 | 2.9 | 430 | 641 | 1.06 | 2 |
| Swaziland | 0.78 | 3.4 | 820 | 900 | 3.3 | 5.06 |
| Tanzania | 27.31 | 3.7 | 280 | 120 | 0.44 | 3.68 |
| Togo | 3.53 | 3.1 | 420 | 390 | -1.64 | 3.18 |
| Tunisia | 8.18 | 2.4 | 1410 | 1260 | 3.78 | 3.54 |
| Uganda | 18.79 | 3.5 | 280 | 250 | 2.22 | 3 |
| Zaire | 35.56 | 3.2 | 630 | 260 | 1.72 | 1.78 |
| Zambia | 8.45 | 3.7 | 600 | 390 | 0.74 | -0.2 |
| Zimbabwe | 9.70 | 3.1 | 710 | 650 | 3.44 | 3.12 |

*Based on information from the UN Industrial Development Organisation and other sources*

**DEMOGRAPHIC PROFILE**

| HDI RANK | Estimate population (million) | | | Annual population growth rate (%) | | Population growth rates over time (1985-90 as % of 1955-60) | Population in doubling date (as current rate) | Crude birth rate 1992 | Crude death rate 1922ighes t population density | Total fertility rate 1992 | Fertility rates over time (a1992 as % of 1960) | Conotraceptiv e prevalence rate (%) 1985-92 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1992 | 2000 | 1960-1992 | 1992-2000 | | | | | | | |
| Vanuatu | 0.1 | 0 2 | 0 2 | 2.8 | 2.4 | 106 | 2020 | .. | .. | .. | .. | .. |
| Lesotho | 0 9 | 1 8 | 2.2 | 2.4 | 2.5 | 139 | 2019 | 35 | 10 | 4.8 | 82 | 23 |
| Zimbabwe | 3.8 | 10.6 | 13.2 | 3.2 | 2.8 | 110 | 2014 | 41 | 11 | 5.5 | 73 | 43 |
| Cape Verde | 0 2 | 0.4 | 0.5 | 2.1 | 2.8 | 77 | 2015 | 36 | 7 | 4.4 | 64 | .. |
| Congo | 1.0 | 2.4 | 3.0 | 2.8 | 2.9 | 140 | 2014 | 45 | 15 | 6.3 | 107 | .. |
| Cameroon | 5.3 | 12.2 | 15.3 | 2.6 | 2.8 | 162 | 2016 | 41 | 13 | 5.8 | 101 | 16 |
| Kenya | 8.3 | 25.3 | 32.8 | 3.5 | 3.3 | 116 | 2012 | 44 | 11 | 6.4 | 81 | 33 |
| Solomon Islands | 0.1 | 0.3 | 0.4 | 3.4 | 3.3 | 117 | 2012 | 38 | 4 | 5.5 | 86 | .. |
| Namibia | 0.6 | 1.5 | 2.0 | 2.8 | 3.1 | 137 | 2013 | 43 | 11 | 6.0 | 100 | 29 |
| Ghana | 6.8 | 16 0 | 20.2 | 2.7 | 2.9 | 97 | 2014 | 42 | 12 | 6.1 | 88 | 13 |
| Core d'Ivoire | 3 8 | 12.9 | 17.1 | 3.9 | 3.5 | 113 | 2010 | 50 | 15 | 7.4 | 103 | 3 |
| Haiti | 3 8 | 6.8 | 8.0 | 1 8 | 2.1 | 124 | 2025 | 36 | 12 | 4.9 | 77 | 10 |
| Zambia | 3.1 | 8.6 | 10.7 | 3.2 | 2.7 | 129 | 2015 | 47 | 17 | 6.5 | 98 | 15 |
| Nigeria | 42 3 | 115.9 | 147.7 | 2.7 | 5.1 | 126 | 2013 | 46 | 14 | 6 6 | 96 | 6 |
| Zaire | 15.3 | 40.0 | 51.0 | 3.0 | 3.1 | 139 | 2013 | 48 | 15 | 6.7 | 112 | 29 |
| Tanzania | 10 2 | 27.9 | 35.9 | 3.2 | 3.2 | 127 | 2012 | 48 | 15 | 6.8 | 100 | 10 |
| Sudan | 11.2 | 26.7 | 33.2 | 2.8 | 2.7 | 151 | 2016 | 43 | 15 | 6.2 | 92 | 9 |
| Burundi | 2.9 | 5.8 | 7.2 | 2.2 | 2.7 | 161 | 2015 | 46 | 17 | 6.8 | 100 | 9 |
| Rwanda | 2.7 | 7.5 | 9.8 | 3.2 | 3.3 | 120 | 2011 | 52 | 18 | 8.5 | 113 | 21 |
| Uganda | 6.6 | 18.7 | 23.4 | 3.3 | 2.8 | 93 | 2014 | 51 | 21 | 7.3 | 106 | 5 |
| Angola | 4.8 | 9.9 | 13.1 | 2.3 | 3.5 | 173 | 2010 | 51 | 20 | 7.2 | 113 | .. |
| Benin | 2.2 | 4.9 | 6.3 | 2.5 | 3.0 | 257 | 2013 | 49 | 18 | 7.1 | 103 | 9 |

| HDI RANK | Estimate population (million) | | | Annual population growth rate (%) | | Population growth rates over time (1985-90 as % of 1955-60) | Population in doubling date (as cuurent rate) | Crude birth rate 1992 | Crude death rate 1922ighes t population density | Total fertility rate 1992 | Fertility rates over time (a1992 as % of 1960) | Conotraceptiv e prevalence rate (%) 1985-92 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1992 | 2000 | 1960-1992 | 1992-2000 | | | | | | | |
| Malawi | 3.5 | 10.3 | 12.6 | 3.4 | 2.6 | 248 | 2012 | 55 | 21 | 7.6 | 110 | 13 |
| Mozambique | 7.5 | 15.1 | 19.4 | 2.2 | 3.2 | 47 | 2015 | 45 | 18 | 6.5 | 103 | .. |
| Central African Rep. | 1.5 | 3.2 | 3.9 | 2.3 | 2.5 | 164 | 2017 | 45 | 18 | 6.2 | 110 | .. |
| Ethiopia | 24.2 | 53.1 | 67.2 | 2.5 | 3.0 | 133 | 2014 | 49 | 19 | 7.0 | 104 | 4 |
| Djibouti | 0.1 | 0.5 | 0.6 | 5.7 | 2.9 | 99 | 2014 | 47 | 17 | 6.6 | 100 | .. |
| Somalia | 3.8 | 9.3 | 11.9 | 2.8 | 3.1 | 91 | 2013 | 50 | 19 | 7.0 | 100 | 1 |
| Gambia | 0.4 | 0.9 | 1.1 | 3.0 | 2.5 | 123 | 2018 | 45 | 20 | 6.2 | 97 | .. |
| Mali | 4.4 | 9.8 | 12.6 | 2.6 | 3.1 | 136 | 2013 | 51 | 20 | 7.1 | 100 | 5 |
| Chad | 3.1 | 5.9 | 7.3 | 2.1 | 2.8 | 132 | 2017 | 44 | 18 | 5.9 | 99 | .. |
| Niger | 3.0 | 8.3 | 10.6 | 3.2 | 3.2 | 168 | 2017 | 48 | 22 | 6.5 | 104 | 4 |
| Sierra Leone | 2.2 | 4.4 | 5.4 | 2.1 | 2.6 | 129 | 2001 | 52 | 22 | 6.9 | 99 | 2 |
| Burkina Faso | 4.5 | 9.5 | 11.8 | 2.4 | 2.7 | 127 | 2016 | 47 | 18 | 6.5 | 102 | 8 |
| Guinea | 3.1 | 6.1 | 7.8 | 2.1 | 3.0 | 138 | 2014 | 51 | 21 | 7.0 | 100 | .. |

## GROWING URBANISATION

| HDI RANK | Urban population (as % of total) 1991 | | | Urban population annual growth rate (%) | | Population in cities of more than 1 million (as % of urban 1990) | Population in largest city (as % of total 1990) | Population in cities of more than 1 million (as % of total 1990) | Major city with highest population density | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1992 | 2000 | 1960-1992 | 1992-2000 | | | | City | Population per km² 1980-90 1990 |
| Vanuatu | .. | 27 | .. | .. | .. | .. | .. | .. | .. | .. |
| Lesotho | 3 | 21 | 28 | 8.6 | 6.3 | .. | .. | .. | .. | .. |
| Zimbabwe | 13 | 30 | 35 | 5.9 | 5.4 | 30 | 30 | 9 | .. | .. |
| Cape Verde | 16 | 30 | 38 | 4.1 | 5.6 | .. | .. | .. | .. | .. |
| Congo | 32 | 42 | 47 | 3.6 | 4.9 | .. | .. | .. | .. | .. |
| Cameroon | 14 | 42 | 51 | 6.5 | 5.7 | 39 | 22 | 16 | .. | .. |
| Kenya | 7 | 25 | 32 | 7.7 | 7.0 | 27 | 27 | 6 | Nairobi | 1,590 |
| Solomon Islands | .. | 8 | .. | .. | .. | .. | .. | .. | .. | .. |
| Namibia | 14 | 29 | 35 | 4.8 | 5.4 | .. | .. | .. | .. | .. |
| Ghana | 23 | 35 | 38 | 3.9 | 4.6 | 28 | 28 | 9 | .. | .. |
| Cote d'Ivoire | 19 | 42 | 47 | 6.5 | 5.5 | 45 | 45 | 18 | Abidjan | 3,030 |
| Haiti | 16 | 30 | 34 | 3.8 | 4.1 | 56 | 56 | 16 | Port-au-Prince | 6,990 |
| Zambia | 17 | 42 | 59 | 7.1 | 5.5 | 29 | 29 | 12 | .. | .. |
| Nigeria | 14 | 37 | 43 | 6.3 | 5.4 | 24 | 20 | 8 | .. | .. |
| Zaire | 22 | 29 | 46 | 4.8 | 5.0 | 33 | 33 | 9 | .. | .. |
| Tanzania | 5 | 22 | 47 | 10.3 | 7.5 | 27 | 27 | 6 | .. | .. |
| Sudan | 10 | 23 | 27 | 5.4 | 4.8 | 34 | 34 | 8 | .. | .. |
| Burundi | 2 | 6 | 7 | 5.5 | 6.1 | .. | .. | .. | .. | .. |
| Rwanda | 2 | 6 | 11 | 7.4 | 7.6 | .. | .. | .. | .. | .. |
| Uganda | 5 | 12 | 14 | 6.1 | 6.6 | 39 | 39 | 4 | .. | .. |

| HDI RANK | Urban population (as % of total) 1991 | | | Urban population annual growth rate (%) | | Population in cities of more than 1 million (as % of urban 1990) | Population in largest city (as % of total 1990) | Population in cities of more than 1 milllion (as % of total 1990) | Major city with highest population density | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1992 | 2000 | 1960-1992 | 1992-2000 | | | | City | Population per km² 1980-90 1990 |
| Angola | 10 | 27 | 36 | 5.9 | 5.4 | 63 | 63 | 18 | .. | .. |
| Benin | 9 | 40 | 45 | 7.4 | 5.0 | 45 | 45 | 17 | .. | .. |
| Malawi | 4 | 12 | 16 | 6.5 | 6.5 | .. | .. | .. | .. | .. |
| Mozambique | 4 | 30 | 41 | 9.5 | 7.2 | 41 | 41 | 11 | .. | .. |
| Central African Rep. | 22 | 48 | 56 | 4.8 | 4.6 | .. | .. | .. | .. | .. |
| Ethiopia | 6 | 13 | 17 | 4.8 | 5.8 | 30 | 30 | 4 | .. | .. |
| Djibouti | 63 | 86 | 85 | 7.3 | 3.5 | .. | .. | .. | .. | .. |
| Somalia | 17 | 35 | 44 | 5.8 | 4.7 | 37 | 37 | 9 | .. | .. |
| Gambia | 15 | 24 | 30 | 5.2 | 5.3 | .. | .. | .. | .. | .. |
| Mali | 11 | 25 | 23 | 4.4 | 5.2 | .. | .. | .. | .. | .. |
| Chad | 7 | 34 | 39 | 7.1 | 5.4 | .. | .. | .. | .. | .. |
| Niger | 6 | 19 | 27 | 7.4 | 6.7 | .. | .. | .. | .. | .. |
| Sierra Leone | 13 | 31 | 40 | 5.2 | 5.1 | .. | .. | .. | .. | .. |
| Burkina Faso | 5 | 17 | 12 | 4.6 | 6.3 | .. | .. | .. | .. | .. |
| Guinea | 10 | 27 | 33 | 5.3 | 5.8 | 76 | 76 | 20 | Conakry | 6,910 |

## TRENDS IN ECONOMIC PERFORMANCE

| HDI RANK | Total GNP | | GNP per capita annual growth rate (%) | | Average annual rate of inflation (%) | | Exports as % of GDP (% annual growth rate) 1980-91 | Tax revenue as % of GNP (% annual growth rate) 1980-91 | Direct taxes as % of total taxes | | Overall budget surplus/deficit (as % of GNP) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | US$ billions 1991 | Annual growth rate (%) 1980-91 | 1965-80 | 1980-91 | 1980-91 | 1992 | | | 1980 | 1991 | 1980 | 1991 |
| Vanuatu | 0.2 | 2.6 | .. | .. | 5.0 | .. | .. | .. | .. | .. | .. | .. |
| Lesotho | 1.1 | 2.7 | 6.8 | -0.5 | 13.6 | 13.2 | .. | 4.1 | 16 | 20 | -3.7 | -0.3 |
| Zimbabwe | 6.9 | 3.6 | 1.7 | -0.2 | 12.5 | 34.6 | .. | 3.5 | 58 | 49 | -11.1 | -6.9 |
| Cape Verde | 0.3 | 4.8 | .. | 2.3 | 9.4 | 9.1 | .. | .. | .. | .. | .. | .. |
| Congo | 2.7 | 3.1 | 2.7 | -0.2 | 0.4 | 3.6 | 7.4 | .. | 64 | .. | -5.8 | .. |
| Cameroon | 10.4 | 2.1 | 2.4 | -1.0 | 4.5 | -1.4 | -6.6 | 1.7 | 24 | 48 | 0.5 | -3.5 |
| Kenya | 8.6 | 4.1 | 3.1 | 0.3 | 9.2 | 25.1 | -2.3 | -0.4 | 33 | 33 | -4.6 | -5.8 |
| Solomon Islands | 0.2 | 6.7 | 5.0 | 3.5 | 12.4 | 10.6 | .. | .. | .. | .. | .. | .. |
| Namibia | 2.2 | 1.6 | 0.6 | -1.2 | 12.6 | .. | .. | .. | .. | 27 | .. | -7.6 |
| Ghana | 6.4 | 3.1 | -0.8 | -0.3 | 40.0 | 12.6 | 8.7 | .. | 22 | .. | -4.2 | .. |
| Cote d'Ivoire | 8.9 | 0.3 | 2.3 | -4.6 | 3.8 | 0.5 | 0.7 | 0.9 | 14 | 18 | -11.1 | -3.6 |
| Haiti | 2.5 | -0.6 | 0.6 | -2.4 | 7.1 | .. | -19.5 | .. | 16 | .. | -4.7 | .. |
| Zambia | 3.4 | 0.7 | -1.2 | .. | .. | 67.4 | .. | -6.9 | 4. | | -20.0 | -5.0 |
| Nigeria | 33.7 | 1.4 | 4.2 | -2.3 | 18.1 | 48.4 | 2.0 | .. | .. | .. | .. | .. |
| Zaire | 8.1 | 1.6 | -1.3 | .. | 60.9 | 65.0 | .. | .. | .. | .. | .. | .. |
| Tanzania | 2.8 | 2.0 | 0.8 | -0.8 | 25.7 | 28.2 | 3.8 | .. | 35 | .. | -8.4 | .. |
| Sudan | 10.1 | 0.3 | 0.8 | .. | .. | .. | .. | .. | 17 | .. | -3.3 | .. |
| Burundi | 1.2 | 4.3 | 2.4 | 1.3 | 4.3 | 6.0 | 7.0 | .. | 20 | .. | -3.9 | .. |
| Rwanda | 2.0 | 0.5 | 1.6 | -2.4 | 4.1 | 4.7 | .. | .. | 21 | .. | -1.7 | .. |
| Uganda | 3.2 | 5.9 | -2.2 | .. | .. | 43.7 | 7.7 | .. | 12 | .. | -3.1 | .. |
| Angola | .. | .. | 0.6 | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Benin | 1.9 | 2.1 | -0.3 | -0.9 | 1.6 | 3.4 | 10.7 | .. | .. | .. | .. | .. |

| HDI RANK | Total GNP | | GNP per capita annual growth rate (%) | | Average annual rate of inflation (%) | | Exports as % of GDP (% annual growth rate) 1980-91 | Tax revenue as % of GNP (% annual growth rate) 1980-91 | Direct taxes as % of total taxes | | Overall budget surplus/deficit (as % of GNP) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | US$ billions 1991 | Annual growth rate (%) 1980-91 | 1965-80 | 1980-91 | 1980-91 | 1992 | | | 1980 | 1991 | 1980 | 1991 |
| Malawi | 2.4 | 3.5 | 3.2 | 0.1 | 14.9 | 15.3 | 0.5 | 1.2 | 39 | 40 | -17.3 | -1.9 |
| Mozambique | 1.2 | -1.1 | 0.6 | -1.1 | 37.6 | 35.0 | .. | .. | .. | .. | .. | .. |
| Central African Rep. | 1.2 | 1.2 | 0.8 | -1.4 | 5.1 | 1.9 | -0.3 | .. | 18 | .. | -3.5 | .. |
| Ethiopia | 6.4 | 1.5 | 0.4 | -1.6 | 2.4 | 10.3 | -6.4 | .. | 25 | .. | -4.5 | .. |
| Djibouti | .. | .. | .. | .. | .. | 3.0 | .. | .. | .. | .. | .. | .. |
| Somalia | .. | .. | -0.1 | .. | 49.7 | .. | .. | .. | .. | .. | .. | .. |
| Gambia | 0.3 | 3.2 | 2.3 | -0.1 | 18.2 | 11.4 | .. | .. | .. | .. | .. | .. |
| Mali | 2.8 | 2.5 | 2.1 | -0.1 | 4.4 | 2.4 | 0.2 | .. | 19 | .. | -4.7 | .. |
| Chad | 1.2 | 6.3 | -1.9 | 3.8 | 1.1 | -4.7 | 1.7 | .. | .. | 29 | .. | -7.3 |
| Niger | 2.5 | -0.9 | -2.5 | -4.1 | 2.3 | 1.7 | 0.9 | .. | 28 | .. | -4.8 | .. |
| Sierra Leone | 0.9 | 1.1 | 0.7 | -1.6 | 59.3 | 94.7 | -2.5 | -7.7 | 25 | 33 | -13.2 | -2.9 |
| Burkina Faso | 2.8 | 4.0 | 1.7 | 1.2 | 3.8 | -0.5 | -0.4 | .. | 20 | .. | 0.3 | .. |
| Guinea | 2.8 | .. | 1.3 | .. | .. | 18.0 | .. | .. | 44 | .. | .. | -4.2 |

## HOUSING PRODUCTION AND INVESTMENT

| City, Country | Housing production per '000 | Housing investment (%) | Industrial concentraion (%) | Import share of construction (%) |
|---|---|---|---|---|
| Tanzaia (Dar es Salaam) | 14.8 | 7.4 | 54 | 10 |
| Malawi (Lilongwe) | 9.3 | 2.3 | 26 | 6 |
| Madagascar (Antananarivo) | 1.9 | 4.4 | 31 | 29 |
| Nigeria (Ibadan) | 2.1 | 2.3 | 1 | 23 |
| Kenya (Nairobi) | 2.7 | 1.4 | 32 | 37 |
| Ghana (Accra) | 2.6 | - | - | 80 |
| Zimbabwe (Harare) | 7.7 | 1.5 | 32 | 10 |
| Senegal (Dakar) | 3.4 | - | 91 | 45 |
| Cote d'Ivoire (Abidjan) | 7.8 | - | 12 | 35 |

## HOUSING CONSTRUCTION

| City, Country | Construction cost ($/m$^2$) | The skill ration | Construction time (months) |
|---|---|---|---|
| Tanzaia (Dar es Salaam) | 67 | 2.7 | 28 |
| Malawi (Lilongwe) | 17 | 3.0 | 2 |
| Madagascar (Antananarivo) | 54 | 1.2 | 6 |
| Nigeria (Ibadan) | 25 | 2.3 | 36 |
| Kenya (Nairobi) | 108 | 2.5 | 2 |
| Ghana (Accra) | 203 | 2.0 | 11 |
| Zimbabwe (Harare) | 569 | 3.0 | 30 |
| Senegal (Dakar) | 394 | 1.7 | 4 |
| Cote d'Ivoire (Abidjan) | 215 | 2.0 | 2 |

• *Taken from Housing Indicators Programme of UNCHS and World Bank*

**ESTIMATES OF CONSTRUCTION COSTS AND MONTHLY HOUSEHOLD INCOME REQUIRED TO PURCHASSE HOUSING OF VARIOUS STANDARDS AND LOCATION, NAIROBI**

| Service standard[a] | Location[b] | Cost per housing unit | | | | Monthly payment[c] | Monthly household income required[d] | Percentage of households unable to afford |
|---|---|---|---|---|---|---|---|---|
| | | Raw land | Land servicing | Basic construction | Total | | | |
| Single-family dwelling[e] | | | | | | | | |
| M | P | 180 | 420 | 1,260 | 1,860 | 17.10 | 114 | 66 |
| M | I | 788 | 420 | 1,260 | 2,468 | 22.70 | 151 | 72 |
| M | C | 17,250 | 420 | 1,260 | 18,930 | 174.20 | 1,161 | 95+ |
| L | P | 180 | 378 | 1,008 | 1,566 | 14.40 | 96 | 59 |
| L | I | 788 | 378 | 1,008 | 2,174 | 20.00 | 133 | 69 |
| L | C | 17,250 | 378 | 1,008 | 18,636 | 171.60 | 1,144 | 95+ |
| B | P | 180 | 336 | 756 | 1,2272 | 11.50 | 77 | 52 |
| B | I | 788 | 336 | 756 | 1,880 | 117.10 | 114 | 66 |
| B | C | 17,250 | 336 | 756 | 18,342 | 166.60 | 1,111 | 95+ |
| Multifamily dwelling[f] | | | | | | | | |
| M | P | 36 | 200 | 1,600 | 1,836 | 16.60 | 111 | 65 |
| M | I | 158 | 200 | 1,600 | 1,958 | 17.70 | 118 | 67 |
| M | C | 3,450 | 200 | 1,600 | 5,250 | 47.70 | 318 | 90 |
| L | P | 36 | 180 | 1,280 | 1,496 | 13.60 | 91 | 58 |
| L | I | 158 | 180 | 1,280 | 1,618 | 14.60 | 98 | 61 |
| L | C | 2,450 | 180 | 1,280 | 4,910 | 44.60 | 297 | 89 |
| B | P | 36 | 160 | 960 | 1,156 | 10.40 | 70 | 47 |
| B | I | 158 | 160 | 960 | 1,278 | 11.50 | 77 | 52 |
| B | C | 3,450 | 160 | 960 | 4,570 | 41.50 | 277 | 87 |

*a. M (medium)= individual toilet and services L (Low)=four households sharing toilet and services. Assumes 10 percent saving in land servicing and 20 percent saving in basic sonstruction costs. B (basic)=centrally located water and pit latrines. Assumes 20 percent saving in land servicing and 40 percent saving in basic construction costs.*

*b. P=peripheral area. I=intermediate zone. C=centre of city*

*c. Assumes a 25-year period of payment and 10 percent interest.*

*d. Assumes no down payment and 15 percent of household income devoted to housing.*

*e. 20 square meters of livable space and 75 square meters of land.*

*f. 20 square meteres of livable space and 15 square meteres share of land*

*Source: "Housing for Low-Income Urban Families - Economics and Policy in the Developing World" by Orville F.Grimes, Jr. published by the World Bank, 1976*

## COMPARISON OF QUALITY AND ESTIMATED COST OF SELECTED HOUSING UNITS FOR LOW- AND MODERATE-INCOME HOUSING : NAIROBI (KENYA)

| Type of Housing and Year | Quality components | | | | | | | Cost components (current U.S.dollars) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of stories | Area per unit (square meters) | | Gross density, dwelling units per hectare | Services | | | Livable space per square meter | | Raw land per square meter | Per unit costs | | | |
| | | Shelter | Land[a] | | Sewerage and water | Electricity | Roads | Land servicing | Basic construction[c] | | Land servicing[a] | Basic construction[c] | Raw land | Total |
| Site scheme, fence only, 1974 | n.a. | n.a. | 125[m] | 65 | √[n] | | √ | 0.9[e] | 0.5[e] | 3.1 | 112 | 56 | 388 | 556 |
| Sites and services A, pit latrine, 1974 | n.a. | 1.4 | 125[m] | 65 | √[n] | | √ | 0.9[e] | 1.8[e] | 3.1 | 112 | 224 | 388 | 724 |
| Sites and services B, toilet and shower, 1974 | 1 | 4.2 | 125[m] | 65 | √ | | √ | 4.8[e] | 5.5[e] | 3.1 | 605 | 684 | 388 | 1677 |
| Core housing A, toilet, shower, stove, kitchen, 1974 | 1 | 11.7 | 150[m] | 55 | √ | | √ | 60.8 | 113.9 | 3.1 | 712 | 1333 | 465 | 2510 |
| Core housing B, toilet, shower, stove, kitchen, roof, and concrete strip for one room, 1974 | 1 | 19.2 | 150[m] | 55 | √ | | √ | 37.1 | 82.6 | 3.1 | 712 | 1585 | 465 | 2762 |
| Core housing C, one room house, 1974 | 1 | 20.5 | 150[m] | 55 | √ | | √ | 34.7 | 104.6 | 3.1 | 712 | 2145 | 465 | 3322 |
| Two-room house A, 1974 | 1 | 32.9 | 150[m] | 55 | √ | √ | √ | 24.9 | 79.9 | 6.9 | 818 | 2628 | 1035 | 4481 |
| Two-room house B, 1974 | 1 | 33.7 | 150[m] | 55 | √ | √ | √ | 24.3 | 98.7 | 6.9 | 818 | 3327 | 1035 | 5180 |
| Three-room house, 1974 | 1 | 42.5 | 150[m] | 55 | √ | √ | √ | 19.2 | 83.5 | 6.9 | 818 | 3550 | 1035 | 5403 |

| Type of Housing and Year | Quality components | | | | | | | Cost components (current U.S.dollars) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of stories | Area per unit (square meters) | | Gross density, dwelling units per hectare | Services | | | Livable space per square meter | | Raw land per square meter | Per unit costs | | | |
| | | Shelter | Land[a] | | Sewerage and water | Electricity | Roads | Land servicing | Basic construction[c] | | Land servicing[b] | Basic construction[c] | Raw land | Total |
| Self-help housing A Kibera Experimental Scheme, 1974 | 1 | 17.9 | 150[m] | 55 | √ | √ | √ | 39.8[e] | 42.3 | 3.1 | 712 | 758 | 465 | 1935 |
| Self-help housing B, Kiberia Experimental Scheme, 1974 | 1 | 35.3 | 150[m] | 55 | √ | √ | √ | 23.0[e] | 30.5 | 6.9 | 818 | 1050 | 1035 | 2903 |
| Self-help housing C, Kiberia Experimental Scheme, 1971 | 1 | 411.7 | 150[m] | 55 | √ | √ | √ | 19.5[e] | 28.1 | 6.9 | 818 | 1176 | 1035 | 3029 |
| Self-help housing D, Kiberia Experimental Scheme, 1974 | 1 | 47.7 | 150[m] | 55 | √ | √ | √ | 17.0[e] | 26.5 | 6.9 | 818 | 1260 | 1035 | 3113 |

n.a. Not available
a. For multifamily units, share of land per housing unit
b. Includes utilities and land development
c. Construction of housing unit and internal services
e Cost per square meter of plot
m. Size of plot based on average size of housing unit built in 1968-70
n. Water supply only.

*Source*: *"Housing for Low-Income Urban Families - Economics and Policy in the Developing World" by Orville F.Grimes, Jr. published by the World Bank, 1976*

## INDICATOR TABLES : HOUSING QUALITY*

| City, Country | Floor are per person ($m^2$) | Persons per room | Households per dwelling unit | Permanent structures (%) | Water connection (%) | Journey to work (minutes) |
|---|---|---|---|---|---|---|
| Tanzaia (Dar es Salaam) | 5.00 | 2.20 | 1.00 | 76 | 52 | 50 |
| Malawi (Lilongwe) | 6.64 | 1.80 | 1.05 | 67 | 31 | 60 |
| Madagascar (Antananarivo) | 5.06 | 5.53 | 1.83 | 43 | 36 | 60 |
| Nigeria (Ibadan) | 9.00 | 2.00 | 1.00 | 100 | 63 | 26 |
| Kenya (Nairobi) | 5.07 | 3.70 | 1.17 | 67 | 40 | 24 |
| Ghana (Accra) | 10.40 | 3.20 | 1.07 | 100 | 49 | 35 |
| Zimbabwe (Harare) | 7.00 | 2.28 | 1.51 | 83 | 97 | 56 |
| Senegal (Dakar) | 8.10 | 2.30 | 1.00 | 84 | 49 | 35 |
| Cote d'Ivoire (Abidjan) | 7.90 | 2.22 | 1.11 | 88 | 33 | 38 |

## HOUSING MARKET DYNAMICS

| City, Country | New household formation (%/yr) | Residential mobility (%/yr) | Vacancy rate (%) |
|---|---|---|---|
| Tanzaia (Dar es Salaam) | 6.9 | 5.0 | 0.0 |
| Malawi (Lilongwe) | 4.2 | 7.0 | 0.0 |
| Madagascar (Antananarivo) | 6.8 | 6.6 | 0.3 |
| Nigeria (Ibadan) | 4.8 | 8.0 | 0.1 |
| Kenya (Nairobi) | 5.0 | - | - |
| Ghana (Accra) | 3.4 | 4.6 | - |
| Zimbabwe (Harare) | 5.0 | 6.5 | 0.8 |
| Senegal (Dakar) | 4.0 | 18.0 | - |
| Cote d'Ivoire (Abidjan) | 3.8 | - | - |

* *Taken from Housing Indicators Programme of UNCHS and World Bank*

**IMPLIED SUBSIDY IN PROVISION OF HOUSING TO LOW-INCOME FAMILIES, BY LOCATION, SELECTED CITIES [a]**

| City | Single-family housing | | | | Multi-family housing | | | |
|---|---|---|---|---|---|---|---|---|
| | Individual services, periphery | Individual services, intermediate | Individual services, periphery | Individual services, intermediate | Individual services, periphery | Individual services, intermediate | Individual services, periphery | Individual services, intermediate |
| Median income, lowest 40 percent of households | | | | | | | | |
| Ahmedabad | 44.9 | 84.5 | 27.0 | 83.1 | 50.9 | 65.8 | 20.6 | 28.9 |
| Bogota | -10.9 | 71.1 | -47.1 | 68.9 | 21.9 | 44.1 | -23.4 | 23.5 |
| Madras | 58.7 | 63.0 | 47.2 | 54.0 | 51.7 | 52.5 | 25.0 | 28.8 |
| Mexico City | -11.8 | 92.6 | -41.7 | 92.4 | -19.0 | 70.1 | -82.1 | 67.1 |
| Nairobi | 65.8 | 74.2 | 49.1 | 65.8 | 64.8 | 66.9 | 43.7 | 49.1 |
| Median income, lowest 20 percent of households | | | | | | | | |
| Ahmedabad | 75.5 | 93.1 | 67.6 | 92.5 | 78.2 | 84.8 | 64.7 | 68.4 |
| Bogota | 21.7 | 79.6 | -3.8 | 78.1 | 44.9 | 60.6 | 12.9 | 46.0 |
| Madras | 65.2 | 69.8 | 55.6 | 61.3 | 59.3 | 60.0 | 36.8 | 40.0 |
| Mexico City | 9.2 | 94.0 | -15.0 | 92.9 | 3.4 | 75.7 | -47.8 | 73.3 |
| Nairobi | 79.0 | 84.1 | 68.7 | 78.9 | 78.3 | 79.7 | 65.4 | 66.7 |

a. *The implied subsidy is defined as percent by which monthly income available for housing falls short of required monthly payment. Based on repayment period of 25 years, no down payment, and 15 percent of household income devoted to housing. Negative numbers denote percent by which income exceeds payment, implying no need for subsidy.*

*Source: "Housing for Low-Income Urban Families - Economics and Policy in the Developing World" by Orville F.Grimes, Jr. published by the World Bank, 1976*

## INNOVATIONS FOR HOUSING FINANCE IN ASIA

The phenomenon of exclusion of bulk of the low income groups and the informal sector from loans offered by the financial institutions is common to both Asia and Africa. it is therefore instructive to look at two significant innovations for extending credit on flexible terms to the poor women. One is the Grameen Bank of Bangladesh, and the other, the Self Employed Women's Association and Bank in India.

The Grameen Bank was started in 1976 by Mohammed Younus. He developed by experimentation a system of lending small sums of money for immediate needs and small productive and housing projects for women, based on group guarantee. the approach was to form small groups of 5 members, and to organise several groups from the same community into centres. The Bank charges non-subsidised rates for the loans, and the loans are repetitive, usually for short periods. The requirement is that members of the group should all be poor, and come from the same socioeconomic group; a member of a group can obtain a loan only if the other four members honour their loan obligations to the Bank; the local centre meets regularly and the members subscribe to certain social obligations. The Bank has a high cost component of field workers who visit the groups regularly in order to assist with projects and to pursue savings and recovery. The recovery rate is over 98%, and the Bank is seen as a non-subsidised model for credit support to the poor

The SEWA was established in 1972 in western India as a trade union os working women in order to create alternative economic organisations and to provide support services. The SEWA Bank was later established in order to create an institution which would provide credit facilities on terms flexible, and appropriate to the special needs of these women. The Bank is structured on (a) an informal atmosphere to put the illiterate women at ease; (b) easy account opening and operating procedures; (c) maintaining confidentiality; (d) facilitating savings through field collection of money collected over the month and kept in a box at home; (e) loans for productive purposes, for repayment of old usurious debts,housing, and emergency credit, and market rates of interest; (f) vigorous follow-up and monitoring of recovery by field staff, and persuasive efforts to assist the defaulters to repay, consequent to which, the recovery rate exceeds 85%; (g) careful selection of staff and their professional development. The impact of the SEWA Bank is seen in the development of the skills of self-employed women in dealing with formal organisations, and in making financial transactions; in the increase of their self-confidence and status in a society which is traditionally male-dominated; in the reduction of dependence of women on moneylenders and middlemen for loans on unfavourable terms, and increased viability of their enterprises due to assured credit. Institutions like SEWA also illustrate the importance of taking a composite view of credit for the poor for a variety of purposes, including trade and enterprise, repair and construction of houses, and for emergency credit, instead of taking a narrow view of housing finance for the poor. This view has gained ground in a number of similar innovative experiments in other parts of India.

## PROPOSED PROJECT FOR COOPERATION IN THE AREA OF DEVELOPMENT AND PROMOTION OF BUILDING MATERIALS FROM LOCAL RAW MATERIALS

A suitable project supported by UNIDO should be formulated to help establish a data base on the availability of local resources along with their characteristics and properties and current uses in developing countries. Such a data base would help identify large common resources of interest to several developing countries in the region which need greater attention both in terms of research and commercial exploitation. This data base could be based in any selected country and made accessible to participating developing countries, and it should be constantly updated. The properties of composites made from these natural fibres should be available in the form of carpet plots similar to what are currently available for synthetic fibre composites since they lend themselves to design of composites using computers.

Once this type of data base has identified large resources common to several developing countries, the next stage would be to develop projects on research and development, prototype plants and on manufacturing of composites using local skills and local infrastructure as far as possible. The research component of such a project can be carried out at an institute located in a developing country like India, which would then transfer the knowledge base to all participating countries. Detailed project proposals involving several countries in African and Asian region has been developed on the lines of two examples as appended.

**Programme Element - I**

**Technical and Industrial Information System - Network**

**Main title**: Proposals on strengthening the data base on natural fibres in different geographical regions in Asia and Africa

**Sub-titles for the suggested R&D projects**

(a) Data base on characterisation of six selected natural fibres and their composites

*(Note: This part of the project-work shall be carried out by six participating countries who have extensive experience of R&D, production and application of the natural-fibres and their composites)*

(b) Contact-points and data-base for 30-40 fibres

*(Note: This will be carried out through field surveys, collection and supply of the samples to the nodal laboratory in India, by 10-12 selected contact-points) (These contact-points can work in their own country in case there are difficulties in travel to other countries)*

Names of the country and names of fibres for work under (a)

| | Country | | Fibre |
|---|---|---|---|
| (1) | India | : | Rice husk, Jute and Cotton lint |
| (2) | Philippines | : | Banana |

(3) Singapore : Straw

(4) Kenya : Sisal

(5) Tanzania : Kenef

(6) Nigeria : Coir

Names of the countries where contact-points will be located for work under (b)

(1) Bangladesh
(2) India
(3) Malaysia
(4) Philippines
(5) Laos
(6) Malawi
(7) Kenya
(8) Tanzania
(9) Nigeria
(10) Sudan
(11) Ghana &
(12) Brazil.

Cost estimates for the work under (a) & (b): Duration 24 months from starting the work

| | Stage of Work-item | Contribution (US$) UNIDO | Participating, country |
|---|---|---|---|
| i) | 18 Fellowships of equal value for (a)&(b) @US$ 5000 each | 90,000 | Local expenses as applicable, including travel etc. |
| ii) | General expenses for collection of samples and despatch for (b) only | 12,000 | Local computer facility where required |
| iii) | Contingency | 3,000 | -do- |
| | | 105,000 | |

**Programme Element - II**

**Promotion of Basic Technological Infrastructure**

**Main title:** Strengthening R&D capability, human resource development and training work.

**Sub-titles for the suggested R&D project**

Strengthening R&D capability in some countries, including training of manpower.

**Participating countries**

Nepal, Papua New Guinea, Laos, Malawi, Ivory Coast and Madagascar

Cost of the project work as above: Duration 36 months from starting the work.

| | Stage of Work-item | Contribution (US$) UNIDO | Participating, agency/govts. |
|---|---|---|---|
| (i) | Provision of equipment for research, development and manufacture of nature fibre reinforced composites in 6 countries (@ US$ 100,000 each | 60,000 | All infrastructure facilities as existing in the form of building & shed, electricity, water, manpower etc. |
| (ii) | Training of manpower from the above 6 countries, 2 each (ie 6x2=12) in each selected country. @US$5,000 fellowships for each participant | 60,000 | 60,000 complementary contribution for salary and allowance etc., as applicable |
| | | 120,000 | 120,000 |

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## ABBREVIATIONS

| | | |
|---|---|---|
| ARSO | : | African Regional Organisation for Standardisation |
| BMTPC | : | Building Materials & Technology Promotion Council, India |
| CBOs | : | Community Based Organisations |
| CSC | : | Commonwealth Science Council |
| ECA | : | Economic Commission for Africa |
| FCR | : | Ferro Cement Roofing technology |
| GDP | : | Gross Domestic Product |
| GFCF | : | Gross Fixed Capital Formation |
| GNP | : | Gross National Product |
| GSS | : | Global Shelter Strategy |
| HUZA | : | Human Settlements of Zambia |
| LDC | : | Least Developed Countries |
| NGO | : | Non-Governmental Organisation |
| R&D | : | Research & Development |
| SEWA | : | Self Employed Women's Association, India |
| SIDO | : | Small Industrial Development Organisation |
| UNCHS | : | United Nations Centre for Human Settlements (Habitat) |
| UNDP | : | United Nations Development Programme |
| UNICEF | : | United Nations Children Education Fund |
| UNIDO | : | United Nations Industrial Development Organisation |

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# CHARTING NEW DIRECTIONS FOR HOUSING POLICIES IN AFRICA

**Study for the Consideration at the Regional Consultation**

## EXECUTIVE SUMMARY

# CHARTING NEW DIRECTIONS FOR HOUSING POLICIES IN AFRICA

## Study for the Consideration at the Regional Consultation

## EXECUTIVE SUMMARY

### 1.0 CONTEXT OF THIS DOCUMENT

1.0.1 UNIDO proposes to organise a Regional Consultation on the Construction Industry with special focus on Housing for Least Developed Countries in Africa as a follow-up to the First Consultation on the Construction Industry held in Tunis, Tunisia in May 1993. The theme of Regional Consultation is, **"Charting new directions for housing policies in Africa"** and the Consultation aims at reviewing the implementation of the plan of action for efficient affordable quality shelters in LDCs. The present study aims at analysing the issues and aspects required to be addressed at the Regional Consultation and in its analysis lays emphasis on: (a) the existing policies and programmes of housing in Developing Countries in Africa; (b) the nature of construction industry activities; (c) the need to improve the capacity of domestic building and construction sectors; (d) evaluating policy options to enhance efficiency of shelter programmes and lay groundwork for further action.

### 1.1 BACKGROUND OF THE STUDY

1.1.1 There is wider recognition of links between housing production, employment and output on one hand and contribution of housing to economic growth and development on the other. In this context, the building industry proves to be a key sector of socio-economic development and the construction industry (building and infrastructure) is being increasingly considered as a critical instrument for developmer

1.1.2 In Africa, housing and human settlement issues are linked to various macro factors such as increasing population, rapid urbanisation and its concentration in large cities, decreasing per capita income, displacement of population on account of wars and internal strife, government policies and unfavourable world economic order and trade regime. The level of urbanisation though low (25-27 percent) in Sub-Saharan Africa but the numbers involved are unprecedented and the expected growth in the next thirty years could lead to urban populations of size - 179 million in Nigeria, 58 million in Zaire, 47 million in Tanzania, and 42 million in Kenya. The Sub Saharan African population of 450 million in 1990 was doubled in 1995, and is projected to reach 1.1 billion by the year 2015.

1.1.3 Since Habitat I: United Nations Conference on Human Settlements emphasis has been laid at all UN fora, on the fact that construction activity in itself can play a crucial role in the development programmes of shelter, infrastructure and services. It calls for policies, programmes, financial mechanisms and institutions to accelerate the provision of adequate shelter, infrastructure and services with particular emphasis on lower-income settlements in urban and rural areas and to facilitate introduction of appropriate building materials through development of innovative technologies and improving capacity of domestic construction industry.

1.1.4 Priorities of the Economic Commission for Africa in this area, are also directed towards (a) strengthening of the indigenous construction sector through transfer of appropriate

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technology, the development of indigenous skills and (b) establishment of commercial small scale production units of selected local building materials which will have direct beneficial impact on housing for rural population and the urban poor.

## 1.2 REVIEW OF SHELTER PROGRAMMES IN PAST AND THEIR EFFECTIVENESS IN ADDRESSING THE HOUSING NEEDS IN AFRICAN REGION

1.2.0.1 In a number of countries in Africa, though the national governments have adopted Housing Policies in keeping with the concepts and strategies of the enabling approach enshrined in Global Strategy for Shelter for All, but the observed failure is widespread. Traditionally the colonial type of construction departments oriented to public construction of roads and buildings with government budgets have little concern and orientation for affordable and appropriate housing and have not adequatley reflected community needs. Systematic movement towards the goals of the strategy, therefore, has to be seen against the following major weaknesses which characterise previous shelter programmes and activities in addressing the needs of low income group housing.

a) Misdirected Efforts
b) Fragmented responses and unresponsive governments
c) Inefficient use of scarce resources
d) Lack of access to the poorest families
e) Inadequate scale of hose construction
f) Lack of recognition for role of Construction in Housing
g) Inflexible and outdated town Planning and Land use Policies
h) Adoption of elitist and unrealistic building/housing standards and materials
i) Disjointed structure of Construction Industry

1.2.0.2 In most African countries, the building industry is fragmented and highly vulnerable due to fluctuation in demand. It has not only failed to cope with the rising demand but the gap between the demand for materials and domestic production of construction output has widened further, in the recent years. This gave rise to increased import dependence in many countries of the region with attendant pressure on prices as well as on the scarce foreign exchange.

1.2.0 3 As in other developing countries three tiers of technology can be found in any of the countries in African region. These can be categorised as **Traditional, Conventional** and **Advanced.** Shelter programmes in most African countries have been often inefficient, inaccessible to low-income groups and the poor. Progress in other key areas such as land, housing finance and technology development and application have also been much less impressive.

## 2.0 PRESENT STRUCTURE AND FUNCTIONS OF THE CONSTRUCTION INDUSTRY WITH FOCUS ON HOUSING IN LDCs

### 2.1 Construction Industry and Economic Development

Construction plays a key role in the national economy through its multiplier effects on other economic sectors. Its backward and forward linkages with other industrial activities induce growth and promote industrialisation, backward linkages representing products and services as inputs to the construction sector and forward linkages being the consumption resulting from construction. Residential construction contributes substantially to country's gross domestic capital formation, for example, it was 15.88

percent of GDCF in Kenya. Construction industry per se, constiutes a huge economic activity thereby contributing nearly 3 to 9% in majority of developing countries while its contribution to GFCF can range between 35 to 80%. Thus it is in the interest of developing countries to encourage building materials and construction enterprises for attracting investment in the sector.

## 2.2 Nature of Construction Sector

2.2.1 The building industry in the context of African countries can be broadly classified according to the major sources of raw materials : those based on imported materials and technologies; and those which rely entirely on locally available materials. The other characteristic feature which can be the basis for categorisation for building industry in most of these countries could be two radically different scales of operation. At one end is the vast number of small scale and micro scale enterprises producing a significant share of the total output of the industry in a highly dispersed manner. At the other end, are the large scale mechanised and sometimes automated plants producing cement, bricks, roofing sheets, sanitary wares etc. and civil engineering projects with advance technology of design, supervision and monitoring by imported know-how. In the absence of any horizontal and vertical linkages between - small/medium and large enterprises industry continues to suffer with low productivity and lack of opportunities for technological upgradation.

2.2.2 Due to low productivity levels of construction industry and poor availability of affordable building materials shelter construction in most countries of Africa, is encumbered by problems of affordability, availability, durability, habitability and vulnerability. The construction sector also faces problems of shortage of appropriate managerial and technical skills as well as lack of support institutional structures for the sector.

2.2.3 The GSS stipulates strengthening of construction industry for shelter delivery by improving access to physical resources consistent with the resource endowments of a country. The basic physical resources for a housing programme include (a) land (with security of tenure), (b) basic infrastructure (water supply, sanitation etc), and (c) the building materials including appropriate technology of construction. A shortfall in the supply of any of these three physical resources will normally result in bottlenecks in the production of housing units and performance of construction industry.

2.2.4 The share of developing countries in the world production of building materials was a meagre 16.7 percent in 1985 and the share of Sub-Saharan Africa actually declined from 1.2 percent to 1.1 percent between 1975 and 1985. In the production of bricks, concrete blocks and tiles figures from Africa and Latin America are lower in 1989 than they were in 1980. Available country data on imports of building materials during 1985 and 1989 indicate that imports were not restricted only to processed materials like cement or steel sheets, but covered as well such minimally processed materials as sand, stone and gravel. The wide-spread shortfall in building materials availability in most African countries and import dependence lead to rising prices obviously depriving the domestic construction industry, in meeting the demand of affordable shelter.

## 2.3 Construction Industry and Policy Environment

2.3.1 There is a multitude of other policies affecting demand and supply of the construction industry which include; programming for population growth; policy for balanced economic growth and income generation; fiscal incentives - both for enhancing

demand of construction works; wage policies for construction labour; energy policies; land-use and town planning policies, policies relating to agricultural settlements etc.

2.3.2 In most African countries, recognition of the inter-sectoral linkages of the construction sector is not reflected in policies of the national governments. It is mportant to note that in the Second Consultation on Building Materials concluded that : creation of a conducive policy environment should be fostered through national dialogue, with the participation of government representatives, professional bodies, the industry and non-governmental organisations active in the shelter sector. In order to promote construction industry through inter sectoral coordination a national-level apex coordination body, with representatives of all concerned should be set up for the purpose.

## 2.4 Shelter Production

2.4.1 Experience in many countries demonstrates that, unless exceptional circumstances exist, direct production of housing by the State is never an efficient use of scarce sources. Against state directly taking up construction the most effective role for governments lies in facilitating the efforts of other actors in the shelter process to make their optimum contribution thereby withdrawing from shelter projects and concentrating instead on the process of shelter development. The role under the new strategy, has to increasingly shift to supporting the innovative experiments in construction technology and building materials through the involvement of NGOs, cooperatives and private companies in the construction of dwellings.

## 2.5 Significance of Building Materials for the Shelter Sector

2.5.1 Building materials accounts for about 50 percent of basic inputs to the construction industry and in the housing construction materials constitute the single largest input sometimes accounting for as much as 75 percent of a low cost house. Persistent shortage of low cost building materials that are durable and can be afforded by vast majority of population, is a serious impediment in improving housing conditions for the people. The problem is particularly acute for the urban low income groups.

2.5.2 One of the underlying reasons why the building materials sector continues to be a bottleneck in low cost housing delivery is that there is a high degree of import dependence in established production units while abundant opportunities for adopting truly indigenous production systems remain only marginally exploited. In most African countries popular materials are inadequate in supply and high in cost. The traditional materials are of low quality and unpopular. New alternate materials developed through research have not as yet been translated into marketable products. In few countries, no doubt, the efforts have been made to promote building materials production based on indigenous factor inputs, but only on a relatively marginal scale. What is actually lacking is an effective strategy for expanding and developing the local building materials sector.

2.5.3 The African continent is rich in raw material resources having vast deposits of soil, laterite, stone, clay, lime stone, gypsum, pozzolana, iron, bauxite, copper, zinc, asbestos, natural fibres and wood from which building materials could be developed. However, most of these raw materials have remained inaccessible for full scale exploitation due to several constraints. Notably, there is lack of data on availability and characteristics of non-conventional raw materials and there are institutional as well as financial barriers to efficient exploitation of available ones.

## 2.6 Lack of Information regarding Nature and Quantum of Demand

2.6.1 Though the needs for housing and related infrastructure increase with growth of population but the nature of demand is largely governed by migration trends in a country besides other factors of affordability, land costs etc. In order to formulate pragmatic policies a demand assessment for construction activities is essentially required. Demand on construction sector are highly fluctuating a id unstable as assessment of housing demand in private sector particularly is not easy - in most countries. Due consideration need to be given to the nature and extent of demand for shelter (new construction and upgradation) and derived demand for building materials to ensure optimal utilisation of the resources invested and the affordability of products and components. Demand assessment for housing has to be essentially based on purchasing power, socio-economic preferences, life style of rural or urban communities, geo-climatic conditions and the disaster-proneness of the region Due to unstable nature of demand, the construction industry is extremely vulnerable, and both the public and private construction sectors are confronted in most cases with disproportionate increases in operational and financial costs.

## 2.7 Structural Weakness and Low Productivity of the Construction Industry

2.7.1 Construction industry in majority of LDCs in African region lacks endogenous technological and production capacity to meet the housing needs of poorer sections of their population. There is no vertical and horizontal linkages amongst the construction enterprises which further inhibits technology upgradation.

2.7.2 In most countries in the African region, the main barriers to improving the productivity of the industry are: (a) industry is highly fragmented and have disjointed material and product delivery system, (b) inability of small firms to fully exploit promising new technologies, (c) high degree of uncertainty resulting from cyclic nature of the building industry, (d) poor quality of labour due to inadequate systems of skill upgradation, and (e) formidable institutional barriers imposed by government building codes and development regulations developed in colonial times. Removing these constraints will require sustained effort of all those associated with the industry supported by international cooperation.

## 2.8 Trends in Construction Industry Technology

2.8.1 Historically, social progress and the development of regional typologies determined the level of housing technology. Studies attribute the technological weakness of construction industry in the Least Developed Countries to a number of factors which mainly include:

(a) a very low level of accummulation of technology;
(b) a limited capacity to import technology - owing to a weak foreign exchange earning capacity and inability to attract foreign investment;
(c) lack of capacity to adapt imported technologies due to shortage of required skills at enterprise levels;
(d) tendency to adopt import intensive models of industrialisation which lack the stimulus that industry could provide for the development of local technologies;
(e) failure to integrate science and technology with the National Development Plans;
(f) insufficient investment in science and technology owing to economic limitations and a relatively undeveloped private sector;

(g) inability to select and manage suitable technologies owing to shortage of technology personnel;
(h) insufficient institutional infrastructure for promoting private sector initiatives based on advances made in other countries; and
(i) the lack of mechanisms supporting the transfer of suitable technologies from the industrialised countries and technological cooperation among the developing countries.

## 2.9 Linkages with Other Economic Activities

2.9.1 The progress in the development of the construction industry is generally marked by improvements in materials, tools and equipment and appropriate technology. In African countries, however, incorporation of such new methods have not been possible due to slow pace of industrial development, lower technological level, limited foreign credits and inadequate internal transport systems.

2.9.2 In terms of appropriate technology it is necessary to promote building materials and construction techniques depending upon the requirements of the housing programmes, availability of transportation network, energy and environmental implications of technology, transfer of technologies from other countries, technical feasibility of adaptation at different levels such as installation; operation; maintenance; production process; and repairs by local skills and services. Thus policies and strategies for development of construction industry are influenced by policy of other sectors of economy.

## 2.10 Regulatory Measures and Documents in the Construction Sector

2.10.1 It is observed that the existing regulatory mechanisms come in the way of promoting large scale housing construction are outdated and fail to address the needs of house construction based on innovative construction practices. Some of the essential regulatory documents required to be reviewed urgently by the national governments include:

i) Legislation on land use
ii) Urban regulation,
iii) Essential requirements to regulate the quality and performance of components and products to be used in construction works.
iv) Standards for materials, building products and installation
v) Codes of practice for traditional and innovative construction techniques
vi) Methods of evaluation and validation of technology
vii) Technical approval systems and regulations
viii) Quality assurance schemes and certification
ix) Liability and insurance

## 2.11 Lack of Innovation in Constructin Technology

2.11.1 To support a healthy shelter delivery system role of innovative building material and construction technologies can not be over emphasised. In most African countries cooperation for development and promotion of new technologies is very limited. This is mainly due to (a) poor communication between innovators and users, (b) lack of attention by R&D institutions to users needs, (c) inadequate market research leading to insufficient attention to product design, and (d) general inadequacy of R&D programmes and methods.

## 2.12 Lack of Institutions for skill upgradation,Human Resource Development

2.12.1 At present in majority of least Developed countries in Africa, there are no effective institutional structures for training in construction related skills, or for providing supports to small scale and informal construction sector. Studies of the small scale construction enterprises indicate that it is particularly vulnerable due to lack of technical and managerial skills which leads to inadequate quality, low productivity, large number of bankruptcies and a poor record of working conditions. Suitable institutional mechanisms are required in each country (at sub-national levels in a large one) for providing integrated range of complementary professional services.

## 3.0 IMPEDIMENTS TO EFFICIENT PERFORMANCE OF THE CONSTRUCTION INDUSTRY - affecting provision of affordable quality shelters

3.0.1 Based on the considerations and structure of construction industry elaborated in earlier chapters of the study report the Consultation should deliberate on the constraints. The main factors which inhibit the development of adequate capacity in the domestic construction industry to meet the needs of affordable shelter programmes in countries in the region include:

i) The fragmented nature of construction industry coupled with inadequate demand assessment methods for public and private sectors makes it difficult and expensive for the construction enterprises to deliver their services and products at desired pace. Low level of development compared to other industrial activities is common to all countries.

ii) Large size of informal sector activities without which lack good management practices or capacity for technological upgradation.

iii) Lack of desired operative interface between the various participants of the construction sector, the decision makers, financing agencies, promoters, contractors, professionals, building material manufacturers & suppliers, equipment manufacturers, R&D and standardisation organisations.

iv) General shortages of financial resources and lack of access of the small and medium construction firms to institutional finance and lack of any vertical integration with large construction enterprises, thereby inhibiting technologies upgradation in small enterprises.

v) Lack of an integrated approach to technology transfer, innovation and upgradation of building material technologies, their production processes and delivery systems and transfer of research output from lab to land. This further hinders capacity building for selection of appropriate technologies.

vi) High economic, cultural, regional and climatic diversity throughout the region, leading to a large range of building patterns and standards which have not been fully adapted in practice.

vii) Persisting dependence on energy intensive and material wasteful methods of construction mainly due to lack of transmission of experience from other countries.

viii) Slow progress in improving the regulatory mechanisms and legislative control on land use. In most countries bye-laws and building regulations formulated in colonial periods still exist and these do not permit any innovation in planning, design and construction. Appropriate standards and specifications have yet to be evolved.

ix) Lack of extensive national effort required for development of standards and set up mechanisms for their practice and enforcement to facilitate use of innovative building materials, products, installations and construction techniques.

x) Lack of awareness on part of enterprises and managers, concerning the gains with adoption of quality and productivity standards, in terms of lower costs and better competitive capacity.

xi) Labour laws and governmental regulations stand in the way as significant institutional forces restraining the development of construction activities since the construction is still not recognised as industry in majority of countries.

xii) Declining quality of skills, lack of training programmes for small contractors and entrepreneurs and low perspectives of salary gains through specialisation at all levels. Lack of institutional arrangements for upgradation of skills and human resource development in majority of LDCs.

xiii) Inadequacy in fiscal and other incentives at central and provincial levels for the construction industry and its products (such as materials and components).

xiv) Lack of policies and promotional efforts for enhancing production and application of innovative alternate building materials particularly based on energy efficient technologies, and recycling of wastes which are renewable raw material resources.

xv) The general policy of all related sectors for contracting services or buying of materials is based on lowest price concept and not on quality and the concept disregard the life-cycle costs.

xvi) Lack of concerted national effort in improving the efficiency and output of the construction sector.

xvii) Lack of continuing interaction between R&D & field organisations; professionals & decision makers; and specifiers & suppliers of materials.

3.0.2 In recent years a collaborative effort of the UNCHS (Habitat) and the Commonwealth Science Council has strengthened the information dissemination capacity by establishing a network of African countries for the promotion, of collection, collation and dissemination of information relating to local building materials and technologies among the participating countries. A similar initiative of the UNDP and UNIDO has led to the establishment of the Regional Network in Asia Pacific for low cost building materials, technologies and construction systems. In a similar initiative a proposal has been recently developed by UNIDO for an Inter-Regional Programme of Cooperation between Asian and African countries in the area of fibre-reinforced composite materials based on local resources. Yet there are no institutional mechanisms available to meet the information needs of prospective entrepreneurs.

## 4.0 PROPOSED OPERATIONAL STRATEGY FOR THE DEVELOPMENT OF THE CONSTRUCTION INDUSTRY WITH FOCUS ON HOUSING

All components of a national shelter strategy must be directed towards the production and improvement of large quantities of housing units to meet rapidly rising needs. This means that in concert with various other actions the capacity of the building industry will need to be enhanced in line with the objectives of economic growth and in keeping with the natural resource endowments of each country. Following paragraphs present the rationale, objectives and basic principles for formulating national strategy for enhancing local capacity to meet needs of affordable quality shelter in Least Developed Countries in Africa.

### 4.1 RATIONALE

4.1.1 Within the framework of Global strategy for shelter all countries increasingly realise their commitment to goals of adequate shelter for all and are in the process of formulating their National Plans of Action. The GSS recognised the need to formulate a strategy based on common principles, policies and approaches underlying country specific actions for a strong construction industry. The rationale for operational strategy for development of construction industry, therefore, is:

i) Success of national action in shelter sector in each country will depend to a large extent on the availability of basic building materials at affordable prices and a strong construction industry based on cost-effective construction techniques, adequate management capacity and optimum use of local resources of skills and capabilities at different levels.

ii) Amendments and adjustments in the policies and institutional structures are required to be introduced and implemented by all countries (including Least Developed ones in Africa) in accordance with country specific needs, to respond effectively to the major supply side and demand side constraints in the shelter delivery particularly for low income groups.

iii) The measures' aimed at development of construction industry can be effectively formulated and implemented by utilising opportunities available through international co-operation, amongst countries of the region, with developing countries in other regions and with developed countries.

### 4.2 OBJECTIVES

4.2.1 The overall objective of the operational strategy is to stimulate action for facilitating achievement of affordable shelter for all. The specific objective is to facilitate the required supply of building materials and construction technologies for affordable quality shelters based on accepted standards, quality, liveability, health and safety.

### 4.3 BASIC PRINCIPLES

#### 4.3.1 Support for enabling strategies

4.3.1.1 A popular misconception about enabling approach enshrined in GSS is that it means less or no role for the government in shelter sector. But it needs to be understood, and perhaps being realised gradually by most governments, that while it does imply fundamental changes in the distribution of responsibilities for different aspects of

shelter production and improvement, the new role for government continues to be critically important. This role no longer expects governments to continue with state-administered housing projects but lies in facilitating and regulating the overall framework within which other actors can make their contributions in most effective way.

4.3.1.2 Initiatives by public housing agencies are required to support people's housing efforts. Public agencies should not be encouraged to undertake direct construction of housing.

4.3.1.3 Governments at the appropriate levels should adjust monetary and fiscal policy to strengthen the effectiveness of existing housing finance systems and should promote innovative financing mechanisms particularly improving access of low income groups to institutional finance.

4.3.1.4 In the area of building materials and construction technologies, the enabling strategies should aim at providing support to small scale sector of material production, strengthening small contractor's capacities and small and medium size construction enterprises to meet the rising needs of shelter sector. The strategy should also promote local initiatives in the production, distribution and use of building materials, enabling local communities to share in the responsibilities and benefits associated with the development of building materials sector. The standards and bylaws should be modified and wherever necessary new ones formulated to permit use of innovative materials and construction techniques. Technology interventions should be planned so that housing for the poor, particularly receives the benefit of cost-effective new building materials and construction techniques.

### 4.3.2 Reorienting role of governments, public agencies and related policies

4.3.2.1 Policy instruments that can stimulate technological capacity-building of the building industry include:

(a) Fiscal policies, direct tax exemption and tariff protection regime for small-scale industries;

(b) Industrial policies - promoting small and medium sector;

(c) Technology policy, - encouraging home-grown labour-intensive technologies;

(d) Manpower development policies, - upgrading of skills and entrepreneurial capacity in the small-scale and informal sectors;

(e) Trade policies and policies on pricing and distribution of building materials;

(f) Building regulations and techno-legal regime through by-laws and controls.

(h) Policy-makers would also have to recognize that the process of technology development, transfer and diffusion of new technologies is generally slow. It would, therefore, require special strategies to improve access to information, appropriate technologies, technology upgradation methodologies etc.

### 4.3.3 Restructuring the Role of Public Housing Agencies

4.3.3.1 National Institutions play a crucial role in translating the policy initiatives of the government into programmes of action. The institutional support is important both for

housing delivery (management of programmes & improving access of people to housing resources) and production of basic inputs like building materials and components.

4.3.3.2 One of the major areas of intervention of national Plan of Action should be institutional restructuring. While evolving institutional frameworks following priority areas require special attention;

i) Promote specificity of role of different agencies by assigning specific tasks such as Land Assembly and Development, Building Skills and Technology Promotion, Community Development, Technical Support and Guidance etc.

ii) The staffing pattern of agencies needs to be radically changed from earlier Public Works Department approach in favour of building up the facilitator role which require a large component of staff from disciplines of community development, finance, estate management, human settlement, planning and design.

iii) Attention to be given to appropriate skill development, re-orienting technical education and undertaking staff training programmes, to take care of present limitations of managerial and technical personnel dealing with shelter delivery programmes.

iv) Policy back-up to be provided for intensive interaction between different housing related agencies for realising a multi-dimensional way of functioning as required in a facilitator's role.

v) There is a need to focus on functions like; building up a data and information system; policy planning; promoting alternative solutions; and evaluation.

vi) Special institutional mechanisms would be required for rural housing programmes.

### 4.3.4 Strengthening Institutional support for building materials

4.3.4.1 Broadly, four types of institutional functions would require strengthening at national level for development of building materials industry: (i) technology development, including adaptation of imported technologies to suit local environment, (ii) manpower development, to upgrade the techno-managerial capacity of the small entrepreneur and the vocational skill of the operatives, (iii) industrial extension services such as assisting the entrepreneur with information and evaluation, and in the acquisition of new technologies leading to the establishment of production facilities, (iv) extending financial support (venture capital, term loans, incentives) for technological upgradation; and (v) standardization, to consolidate the gains of the technology acquisition. In this connection, national governments should take up large scale dissemination of information regarding nature, location and accessibility of local available raw materials, as well as their possible use as building materials, geographical and geological mapping, fiscal concessions and investment opportunities available for prospective investors. To serve the purpose, additional road network and new legal measures against existing bureaucratc bottlenecks would be required.

### 4.3.5 Rationalising Norms, Standards, Regulations,

4.3.5.1 Standardization needs to be seen as a valuable means of technology diffusion in the

building industry. Norms, standards, regulations and planning procedures, though basic regulatory instruments, should not be used only as control measures but should provide guidance to all concerned with a view to create a climate for investment and innovation in the shelter process. In this regard regulations and standards would have to be made more affordable and user friendly and at the same time to ensure acceptable quality of life. Governments can strengthen the role of standardization in technological capacity-building of the building materials and construction industry by following initiatives:

(a) Promoting active collaboration between the national standardization agency, RD&E institutions and the domestic industry; national drafting groups should be set-up for revision of existing and formulation of new standards.

(b) Prioritizing areas requiring standardization within the building materials and construction industry.

(c) Promoting the product certification schemes for promoting use of new building materials.

(d) Supporting RD&E institutions and industrial extension agencies in disseminating information on new standards and their implementation to small entrepreneurs.

### 4.3.6 Strengthening Participation of Private Sector, NGOs and Community based Groups

4.3.6.1 An enabling strategy, should strengthen efforts of governments for capacity building, institutional development aiming at enhancing the roles of all key actors in shelter process-particularly private sector, cooperatives, community based organisations, and NGOs. Formulation of a suitable strategy for optimising resources and capabilities of these groups will largely depend on human resource development institutional reform, organisational and management development and continuous training and capacity building at different levels. This can be achieved by sharing of experience at national and international level and by networking activities of capacity building institutions (which in a country specific situation may themselves require strengthening) which must receive high priority in policies of national governments in developing countries.

### 4.3.7 Increasing access to housing finance, land, appropriate building materials and technology

4.3.7.1 To improve access to resources attention needs to be paid to removing shortages, keeping the prices at reasonable levels and promoting appropriate strategies of production, mobilisation and allocation. Such actions would include, advanced programmes of land assembly; establishment of Urban Land Management Units; restructuring of funding agencies; development of modified rules, regulations and legislations with respect to land; enhancing the role of intermediaries between financing institutions and people; creation of production and marketing centres for low priced building materials and low cost sanitation systems etc.

### 4.3.8 Stimulating International Cooperation

Transnational transfer of know-how may be an extremely efficient means for improving efficiency and productivity of a country's construction industry enabling it to address the needs of shelter sector and other civil engineering projects. Transfer of knowledge and

sharing of experience has to encouraged amongst the developing countries themselves (South-south cooperation) and amongst industrialised and developing countries (North-South Cooperation). Cooperation programmes can be considered in following areas.

#### 4.3.8.1 Among developing countries

Some of the most important areas where international cooperation should be enhanced are:

(a) regional networks for the exchange of information relating to new technologies and materials;
(b) development of common guidelines for the selection and acquisition of technologies from the international market, based on the shared experience of developing countries;
(c) sharing of research, development and engineering facilities in regions and sub-regions to maximize the utilisation of scarce skill and equipment;
(d) sharing of expertise in raw materials prospecting, particularly between resource-surplus and resource-deficit countries;
(e) developing regional and sub-regional standards and specifications for local building materials, to avoid repetitive national endeavour; and
(f) the establishment of regional training programmes on development of micro enterprises for building materials production, also on the development of technical and management skills for men and women.

#### 4.3.8.2 Cooperation between industrialised and developing countries

North-South collaboration, needs to increasingly focus on:
(a) promoting the rapid transfer of newly developing technologies in building materials production, especially those which involve energy reduction in existing processes, development of new low-energy materials and insulating materials, utilisation of industrial and agricultural wastes, and pollution abatement;
(b) helping to strengthen the design and engineering capabilities of national building research institutes in the areas of product and process development, pilot-plant studies and technology adaptation;
(c) supporting the activities of national and international appropriate technology groups and other NGOs in the development, transfer and diffusion and cost-effective technologies;
(d) promoting industry-to-industry links for small industries in the building materials sector between industrialised and developing countries; and
(e) encouraging the flow of development finance from bilateral and multilateral sources to human settlements projects in developing countries which incorporate development of construction industry.

## 5.0 PROVISIONAL CONCLUSIONS & RECOMMENDATIONS - Points for consideration by the consultation

The present study has highlighted the multiple inter-relationships that exist between different components of construction industry. It has also analysed the various factors which work as major constraints - which may, of course, differ from country to country. Based on the analysis following issues have been chosen for consideration of the consultation.

The consultation may like to consider the following issues for discussion:

**5.0.1 FOR NATIONAL LEVEL ACTION**

5.0.1.1 Will following measures help national governments to facilitate expansion of domestic capacity for production of building materials locally and adaptation of new technologies to meet the needs of shelter for all.

i) Encouraging contribution and participation of local communities in the shelter process and support activities of private and informal sector. Suitably structured institutional mechanisms for technology transfer to be set up at the grass root levels to promote appropriate materials and construction techniques in different geo-climatic conditions to help in the local shelter construction process.

ii) Creating a favourable climate for enhancing technology status and productivity levels in the construction related domestic enterprises through necessary modifications in the policies of sectors like energy, environment, industry, trade, employment, and by evolving suitable systems of pricing and distribution and fiscal incentives for the sector.

iii) Strengthening the existing institutional framework to assist the construction industry capable of undertaking industrial extension services, extending support to small scale and informal sector enterprises by improving their access to new technologies through extension, training, and facilitating procurement of raw materials and marketing supports.

iv) Facilitating the access of building material producers to formal institutional credit on flexible terms to meet their investment and working capital needs if the proposal to set up production unit lies in the selected range of appropriate technologies.

v) Initiating policies for creating partnerships between domestic enterprises and those from other developing countries through joint ventures to improve capacity, methodology and technology in domestic construction industry for addressing needs of varying income groups.

vi) Initiating where non-existent and strengthen where existing, efforts for international cooperation in research and development in developing new building materials from local resources and develop appropriate innovations in architectural, engineering, design and better management and organisation of construction activities.

vii) Introducing a flexible and forward looking regulatory mechanism based on standards, codes of practice and specifications to facilitate adoption of innovative cost effective building materials and construction techniques in practice. A suitable system and institutional mechanism will be required to identify, evaluate and validate appropriate new technologies which could be promoted and adapted in the local construction practice.

viii) Encouraging those construction techniques which permit minimisation in the consumption of industrially produced materials and permit use of locally produced cost effective alternate materials. Thus formulating policies for giving financial support and fiscal incentives to stimulate investment in the production of innovative building materials should also be formulated and adopted.

ix) Creating an apex organisational setup to operationalise an integrated approach for improving efficiency and productivity of construction sector. This should function as a nodal agency for the growth, development, modernisation and professionalisation of construction industry as a whole.

### 5.0.2 FOR INTERNATIONAL COOPERATION

5.0.2.1 Will following programmes of cooperation amongst developing countries in Africa or from other regions enhance the domestic capacity of production of building material, and adaptation of cost effective construction technologies.

i) Formulation of a national construction technology policy which would encourage sharing of experience and expertise in following areas:

a) setting up of industries for producing building materials and components in in appropriate size of enterprises by applying new process technologies or by upgrading technology of existing enterprises;
b) setting up of industries for producing simple equipment and machinery required to apply new technologies and other technical supports required by such production units;
c) setting up of institutional mechanisms for financial assistance schemes, distribution centres and supply on credit terms through which construction enterprises can obtain these equipments and machineries;
d) setting up of training and demonstration facilities for construction enterprises to gain knowledge about the effective usage of new technologies, new equipments, and management methods.

ii) Promoting regional cooperation to widen the market for industrially produced building materials particularly at large scale manufacturing units, covering materials like cement, iron & steel, galvanised iron & aluminium sheets, glass, plywood, and boards, etc. since establishment of such large production units may not be economically viable in every country.

iii) Creating channels for seeking assistance and establishment of institutional mechanisms both among developing countries and between industrialised and developing countries for the exchange of knowledge and experience in research and development, training and legislation, setting up of techno-legal regimes with a view to strengthening institutional support to building materials and construction sector for delivery of affordable quality shelters.

### 5.0.3 ROLE OF INTERNATIONAL AGENCIES

5.0.3.1 Will support from the international community and assistance agencies for national initiatives in developing countries on the following lines enhance capacity of domestic construction industry for speedy shelter delivery systems.

i) Establishment of short and medium term programme of activities including funding support to explore commercial potential of appropriate building materials and construction technologies by encouraging cooperation among developing countries.

ii) Providing assistance in increasing flow of development finance from bilateral and multilateral sources for speedy development of building materials sector in selected areas.

iii) Establishing programme of cooperation between African and Asian countries to increase the flow of know-how on new material and construction technologies which have been the subject of research and demonstrated their capacity for adaptation in other countries of the African region.

iv) Promotion of research and development of new materials and construction methods based on the use of local mineral resources, organic and vegetal fibres, forestry and agricultural residues, mining and industry wastes and by-products to facilitate development of cost effective building materials and components for housing construction.

v) Establishment of programmes and mechanisms to stimulate, monitor and coordinate technological cooperation relating to the strengthening of domestic building materials and construction industry for meeting the needs of housing and building.

vi) Support for dissemination of information through preparation of handbooks, manuals and technical guidelines on various aspects such as production of building materials, adoption of newly developed and proven construction methods and systems and compendiums on various types of appropriate technology.

vii) Extending assistance to governments to formulate appropriate materials and building standards, regulations, supporting of construction technologies development and dissemination for wider application.

viii) Establishment and strengthening of construction related research centres. These centres to cover activities such as; (i) relate their R&D work to national developmental priorities, (ii) seek to increase contract research, (iii) endeavour to improve their links with the industry, and (iv) widen the scope of their activities to incorporate all aspects of technologies.

ix) To support training programmes and demonstration projects for construction managers either within the countries or outside for familiarising with the methods adopted else where for efficient management of housing programmes particularly aimed at housing needs of the poor and low income groups.

## 6.0 AGENDA FOR ACTION : STRENGTHENING OF DOMESTIC CONSTRUCTION INDUSTRY

Though the strategy and plan of action should emerge from the discussions and consideration of the issues proposed under the section on `Points for Consideration' in the foregoing. However, in view of several common characteristics and the country situations obtaining in most LDCs in Africa, an agenda for action should be to strengthen the domestic construction industry on the lines indicated in the following paragraphs:

### 6.0.1 TECHNOLOGY MANAGEMENT

Under a national programme of industrial strengthening and restructuring of construction industry technology management should be conducted at the three levels i.e. at **regional level** (intra country) to ensure appropriate institutional framework for technological education, research and development and the transfer and incorporation

of technologies; at the **sub-sectoral level** to develop strategies and priorities which will enable building materials and construction sub-sectors to upgrade design, innovation and quality capabilities by promoting specialisation in order to meet the critical needs of the local markets, and finally at the **enterprise level** aiming at generating capacity for absorbing new technologies and stimulating technological innovative aptitude to improve products. quality and marketing.

Following actions at national level are recommended:

i) Information to be disseminated on construction technology relevant to specific geo-climatic regions and dissemination should be extended within the network of African countries on building materials and technologies to cover aspects other than materials and techniques.

ii) Technology demonstration, prototype and pilot plant projects should be established for creating confidence in cost-effective technologies. Use of selected proven technologies in the construction of civic/community buildings both in urban and rural areas will create high visibility examples and help in building confidence and acceptance of new technologies.

iii) TECHNOLOGY MANAGEMENT AND INDUSTRIAL INFORMATION CENTRES should be established at national and sub-regional levels. These centres will undertake evaluation and selection of appropriate technologies in close collaboration with the enterprises and would also provide support services required for management of technology and industrial information, sourcing of suitable technologies, arranging professional consultation and training by identifying technology requirements of enterprises. The centres would utilise enterprises' experience as a tool for demonstration and transfer of technology and would also serve as an interface between the science and technology infrastructure of the country and the enterprises at the field level.

iv) Strengthening of linkages between productive sector and scientific and technological infrastructure should be taken up as a national priority by formulating adequate policies before a broad based industrial restructuring and strengthening programme can be taken up in a serious way.

### 6.0.2 IMPROVING FINANCIAL BASE

There could be four ways of increasing the supply of housing; (a) development of housing finance systems linked to household savings thus facilitating housing finance to low income household, (b) development of local housing finance systems thereby shifting roles of central finance organisations operating in the formal sector of housing finance, (c) financing of rental housing production, and (d) strengthening financial base of construction and building materials industry to meet the rising demand of building materials and construction systems from different sectors. In the context of the present study the last of these options i.e. improving the financial base of the construction industry has been emphasised.

Financing the development of construction industry is one of the key variables in promoting economic growth. This calls for addressing the weaknesses in the national development financing structures and systems of financial intermediation. It will consequently need to review the main issues relating to the role of financial services sector in channelling finance to the productive sectors. The restructuring programmes

of construction sector will have to take into account the relationships that exist between financial intermediaries and enterprises. An indepth analysis will help in evolving country specific strategy for modernisation of the financial services available to construction industry and its obligatory role to cater to the decentralised needs of housing market. The goal of the restructuring financial system should be to make available adequate resources at the disposal of an efficient system of financial intermediation which in turn should meet credit needs of different segments at reasonable cost.

### 6.0.2.1 Action at National Level

Success of industrial restructuring programme will largely depend on modernisation of the financial services and efficient functioning of intermediaries. Financial reforms should aim at : modifying financial protection structures; liberalising interest rates and stimulating domestic savings; improving competition between the state and private sector banks; introducing innovative banking institutions to meet the needs of large size of informal sector. In this context following actions are recommended for consideration of the consultation:

- Need to generate additional domestic savings, identify alternative sources of bilateral and multi-lateral external finance and improve effectiveness of resource allocation.

- The concentration of available financial sources in a special national fund for industrial restructuring should be considered. Such a fund can be operated either by the Central Bank in the country or through various commercial banks available in a country.

- Strengthening of information and data base on various aspects of macro-economic and sub-sectoral performance and growth trends in construction sector for efficient analysis to be undertaken by financial intermediaries.

- Need to augment the financial resources for technology upgradation of the enterprises and for other aspects like; support for project identification, preparation, appraisal and implementation.

- Techno-financial feasibility studies should be undertaken indicating indepth analysis of the suitability of a production process and appropriateness of a technology having clear market potential for innovative building materials and construction technology projects to facilitate proper consideration by financial institutions for extending loan support etc.

- The national level Technology Management and Industrial Information Centre should be set up to identify proven technologies and delineate guidelines which could be considered while providing financial and technical support services by the financial and banking institutions. The Centre should also be entrusted with the task of formulating projects requiring technical cooperation with other countries or financial assistance from international agencies.

## 6.0.3 TECHNICAL COOPERATION & ASSISTANCE - ROLE OF UNIDO

For improving productivity in the construction industry following recommendations are offered for establishing cooperation programmes amongst the developing countries

and assistance from international agencies.

a) Case studies of construction industry in a variety of developing countries of African region should be undertaken to assess trends in construction productivity and cost-effectiveness for evolving performance parameters/indicators to take care of the rising demand of housing units.

b) Case studies also need to be undertaken to determine the extent to which prefabricated and manufactured building components and the appropriate level of prefabrication based on local raw material resources and skills that can be adapted for use in LDCs in African region. UNIDO should help in evolving Action Plans for improving construction industry productivity and cost effectiveness in selected countries. Where the national governments are interested, a full programme should be undertaken for strengthening and restructuring of construction industry particularly in the context of improving market for housing delivery. Policy supports with adequate financial backup should be created to intensify the production of innovative cost effective construction materials and techniques which are:
   - currently adapted to real technical requirements and economic resources available;
   - based as much as possible on local raw material resources and skills;
   - scientifically conceived, tested and validated;

c) UNIDO should encourage and establish bilateral and multilateral cooperation programmes to extend support in terms of the following initiatives

   i) Opportunities should be offered to countries in the region to share information and experience of common interest. The countries in the region should take initiative by proposing such technical assistance and cooperation programmes and projects.

   ii) Extend financial assistance and provide technical guidance to undertake studies to strengthen construction industry data covering the aspects of performance, changing trends, rising demand, educational and R&D needs of the domestic construction sector. A sample project is indicated in *Annexure-IV*. Detailed project proposal for cooperation between developing countries of Asian and Africa has been earlier submitted to UNIDO.

   iii) Assist governments of countries in the region in creating national coordinating apex institutions for construction industry and offer possibility of a network for information exchange on regional and global level. The existing Network of African Countries established by Common Wealth Science Council in collaboration with UNCHS should be taken advantage of.

   iv) Encourage the establishment of joint projects in product development, production of building materials, strengthening of training and management services and operating construction enterprises. These projects can be developed amongst the countries in the region or with other developing countries or with developed countries.

   v) Support establishment of national Technology Management and Industrial Information Centre as well as the establishment of regional

network of such centres. In case few existing institutions are identified to perform such activities then their activities in the area of building materials, construction techniques and design should be supported by UNIDO.

vi) UNIDO should work with other UN and international and national agencies to develop more appropriate building and construction standards which would facilitate use of innovative cost effective and durable building materials products and construction systems.