



**League of Arab States**  
**CAMRE**

**Sustainable Building & Construction**

**In**

**The Arab Region**

**June 2005**

# Sustainable Building and Construction in the Arab Region

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## **Introduction**

Building and construction constitute the backbone of the various development policies which have either a negative or positive impact on the different development sectors. At the Arab level, the building and construction industry has achieved high development rates in the past three decades. Yet, in spite of such development, the economic and technical importance of this industry has not received the due attention due to the absence of any link within the Arab market, and the lack of integration and unity in the industry per se, being scattered in small country-based frameworks. Therefore; it can not properly contribute to development unless it becomes an integrated system.

The Arab paper has been prepared through the collaboration and coordination of all the Arab countries, in terms of exchanging data and sharing information on the status of the building and construction industry in the Arab Region. The paper also tackled the means of developing it, and the fields in which the Arab countries need each other on the one hand, and those in which they need the international community on the other hand. That is with a view to promoting sustainable building and construction processes in the Arab world.

This paper covers four themes dealing with the current status of the building and construction industry in the Arab world, obstacles to its development, and what is needed to overcome such obstacles, at both the Arab and international levels. These four themes are:

- 1- The current status of the building and construction Industry.
- 2- Sustainable management of the infrastructure and buildings.
- 3- Means for developing the building and construction industry.
- 4- Scope of sustainable building and construction in the Arab region.

## **First Theme: The current status of the building and construction industry**

The building and construction sector is vital to the economy, as it is diversified and covers several fields that are interrelated with the various sectors of economy. This sector represents about 10% of the gross world product, provides 7% of the work opportunities, uses about half of the world's natural resources and consumes about 40% of the world's sources of energy. Building materials constitute the major elements in the buildings costs, ranging between 64% and 67% of the basic cost of any building. Thus the increase in its cost consequently leads to the increase in the cost of buildings.

### **1-1-The legislative and legal framework governing building and construction**

The building and construction sector is governed by several legislations enacted by several bodies and authorities. In many cases the enforcement of such legislations faces many obstacles which curbs the effective implementation of such legislations. These may be summed up in the following:

- There are many laws and legislations governing and organizing Urbanization.
- There are multiple bodies concerned with building and construction, and there is lack of coordination among them.
- The limited resources of the local administrations.
- The personnel are not assigned according to the tasks they are entrusted with.
- The local administration doesn't have full executive authorities to deal with the violations.
- The regulations governing buildings are not compatible with the social and environmental conditions.

The ministries and departments of housing and public works in many Arab countries in the region have taken several steps to address this situation, chief among which was the scientific intervention they have made to define the problems in this sector and to find approaches to the best solutions. The past decade has experienced several achievements with regards to dealing with the negative aspects of the legislations in the building and construction sector, on top of the list are: -

- Amending the laws of urban planning so as to allow for the development of different parts of the country; be it agricultural, industrial, mineral, coastal or tourist-based.
- Determining the optimum land use, allocating lands for the different purposes, protecting the agricultural lands from urban encroachments, and defining major highways network.
- Distributing planning power between the central and local authorities.

- Amending the building laws to avoid the haphazard unplanned urban spread, taking into consideration the social, environmental and daily life characteristics of the local communities.
- Organizing all construction activities related to building licenses, regulations, sanitary and environmental conditions for buildings.
- Amending the legislations that have a social perspective and that are related to housing finance, facilitating housing loans, and reducing the interest on such loans.
- Amending the legislations dealing with the relationship between the landlords and tenants so as to encourage investment in housing for rent.
- Encouraging and supporting the private sector to get involved in building and housing related activities.
- Enacting laws and regulations that aim at protecting the environment from pollution resulting from mines or the building and construction industry.

Most Arab countries have enacted national legislations to protect the environment. Many have set up committees or ministries for environmental affairs. Moreover the Council of Arab Ministers Responsible for the Environment (CAMRE) tries to enhance Arab capacities in this field. However, the implementation of the environmental legislations is still limited. Furthermore, CAMRE has, in collaboration with some Arab federations and regional and international organizations, issued several directories to define the environmental impact of some activities. CAMRE is also currently preparing directories for environmental monitoring and inspection.

## **1-2- Building Raw Materials and Industry**

Raw materials for building industry are abundant in the Arab world in varying quantities, types and level of quality, to satisfy all the buildings needs. These resources are usually found very close to urban areas, to infrastructures and utilities; thus facilitating the utilization of and reducing the cost of processing such materials. The building raw materials available for building in the Arab world are :

- Mud
- Gypsum
- The various types of stone debris (including lime stone and its derivatives; such as cal dolomite, sand, pebbles, basalt...etc).
- Decorative stones (marble, granite...etc).

### **It is worth mentioning that:**

- Some of the raw building materials in some countries such as Yemen are still not adequately utilized; particularly those used in manufacturing industries, since it requires vast investment.

- Manufactured building materials may be divided into two categories: the local and the imported. Most Arab countries try to encourage the local building materials industries so as to reduce the cost of building and limit dependence on imported materials.
- Arab cement industry is one of the industries that has greatly developed over the past two decades. The Arab Republic of Egypt comes first in the production and consumption of cement (more than 30 million tons/year) followed by Saudi Arabia (more than 23 million tons/year). Large amounts of cement are exported from some Arab countries to the different Arab and international markets.
- The ceramics industry is one of the relatively new industries in the Arab world with the exception of Egypt, UAE, Morocco and Tunisia.
- In spite of the widely spread use of manufactured building materials in the Arab world; yet some do not cover the needs of the building and construction industry in the region, such as iron bars, other metal products, and glass.

### **1-3- Planning, designing and applying building and constructions techniques**

Building and construction technologies represent the effective solution to meet the ever increasing demand on quality, together with finalizing major projects on time, increasing the productivity of these materials, and maintaining high levels of vocational safety at the construction sites. Compared to other economic sectors, the building and construction sector is characterized by the huge number of workers (being a labor intensive industry). The decision to use advanced building and construction technologies is affected by the feasibility studies, which is manifested in the comparisons in the cost of employing highly skilled labor, modern technologies and equipment that require more or less intensive capital; particularly at the early stages of application of these technologies and the specific requirements of the project. This is perhaps why some companies prefer capital intensive investment in advanced building technologies while reducing the dependence on labor, while other companies prefer dependence on the available labor and reducing investment in modern technologies. But with the dire need to expedite the carrying of projects, especially those of the infrastructure, and with the increasing demand on quality requirements, there is bigger tendency towards resorting to technologies that fulfill these objectives. Partnerships between major Arab and foreign companies in the carrying out of giant projects (such as tunnels and sewage plants) represent another additional and effective means of transferring modern building and construction technologies to the Arab world.

### **1-4-Recycling of building and construction waste**

The scattered nature of building and construction activities renders the monitoring of environmental deterioration as a result of such activities quite difficult. Besides to

exhaustion of energy and natural resources, and the resulted emission, the environmental impact of this industry is not only limited to the production of waste and debris but goes beyond that to include air and soil pollution, and water contamination. This requires the optimum use of resources and the strict abidance by the regulations, and compliance to the standards to ensure the sustainability of this very vital sector.

The Arab Region now faces a number of environmental problems, most pressing of which is the accumulation of solid waste. The wastes of building and construction materials as well as those of demolishing buildings constitute a grave problem. This explains why some of the Arab countries, like Egypt and Kuwait, have taken successful steps to attain the following:

**A- Recycling and reusing some of the wastes of certain building materials such as;**

- Waste of ceramic industries.
- Waste of crushers and quarry works at lime stone, basalt and gypsum quarries.
- Waste of building bricks (specially the mud-based ones)
- Dust of side pass ways in cement furnaces.

**This is to be achieved through:**

- Recycling of and using waste in the same industry, to be coupled with rationalized use of natural materials involved in this industry.
- Using these wastes as components in other building materials.

**B- Processing the ruminants of building and demolishing to be reused as components in other building materials;**

The attempts of these countries have proven the following: -

- Standardized specifications of manufactured building Materials which include wastes of building materials should be defined.
- The technologies of recycling of and reusing these materials must be characterized by the following:
  - simple and economically efficient operation;
  - reducing the cost of the product to be less than its equivalent in the local market while at the same time complying with the standards;
  - such activities should be located outside the residential area;
  - Building materials should be free of any health restrictions, be it radiations or reactions.

**Means of lifting the environmental pressure resulting from the building and construction industry:**

The most important means in this respect are:

- Establishing mechanisms to enhance integration between the energy, industrial and environmental sectors;
- Paying more attention to the allocation of land uses whether regarding the choice of sites, of new establishments, or of extraction of the raw materials;
- Recycling of and reusing agricultural and metal wastes as well as those resulting from the manufacturing of building materials and the demolishing of buildings.
- Monitoring the environmental impact of the building and construction industry and preventing such from exceeding the specified limits.
- Rationalizing and optimizing the use of energy, and using solar energy in heating, air conditioning, and other uses, since the solar energy abounds in the Arab world. This should particularly apply to remote areas and to those areas which are not connected to electricity networks. This would also reduce the emissions and the greenhouse gases that pollute the air.
- Granting tax incentives in the selling of energy-saving buildings.
- Introducing environmentally friendly technologies in the industry of building materials.
- Ensuring that both the designer and the contractor comply with the environmental requirements in constructing major projects.
- Encouraging the use of building materials that have a low consumption of energy and heat insulators. For example the United Arab Emirates has enacted legislation which states that the use of heat insulators shall be mandatory in all buildings.
- Reducing the use of heating and air conditioning equipment by having appropriate designs for the outer facades of buildings to ensure a rationalized utilization of energy.
- Encouraging governments to play their respective role in promulgating regulations to ensure lifting the environmental pressure posed by the building and construction works. This is to be coupled with training cadres, promoting public awareness and offering economic incentives to help mitigate this pressure on the environment.

### **1-5 Problems of the building and construction industry**

The key problems are:

- The high price of land whether allocated for housing or other non housing purposes, which constitutes not less than 30% of the total cost of any project, a matter that adversely affects the growth of the building and construction industry.
- The shortage in financing resources; which is a basic element in the building and construction industry, along with the ineffective policies pursued to provide the necessary financing.

- The poor coordination between researchers, specialized agencies and those involved in the implementation; thus constituting a major obstacle to improving the achievements in the construction industry, ensuring quality, safety and sound use of building materials.
- The ever increasing demand on building materials; leading to the excessive use of energy in the production of building materials, in the construction industry and in the use of buildings. Therefore, procedures to ensure the rationalization of the use of energy in all these processes must be specified.
- The negligence of restoration, maintenance and rehabilitation of buildings and infra structures in construction activities; makes it inevitable to draw guidelines on the maintenance and rehabilitation of buildings at the phase of estimating the construction cost estimations for new works.
- The lack of accurate statistical data and information with respect to demand on construction activities. Consequently, it is very difficult to have a clear estimation of the future needs, so as to plan and predict the demand on building materials, whether as regards equipment or man power.
- The lack of public awareness regarding the necessity of environment protection and the using equipment and technology to achieve such protection.

#### **Ways and means to overcome these obstacles:**

- Establishing national mechanisms to facilitate and ensure the joint action by all the parties involved in this industry (consultants, contractors, manufacturers of building materials...etc.), and their collaboration to take initiatives aiming at enhancing, developing, supervising and monitoring a sustainable building and construction industry in a sound integrated manner.
- Enhancing cooperation among specialized research institutions and those engaged in the domain of building and construction.
- Endeavoring to attract more investment to this sector by adopting more measures to liberalize the economy and to expand credit facilities.
- Protecting the activities of small and local contractors by adopting measures that ensure the stability of demand on construction in the various sectors.
- Paying more attention to the maintenance and rehabilitation of establishments and infrastructures in the construction activities. In this respect, governments should adopt policies that take these issues into consideration.
- Establishing information systems that cover demand on the various components of the building and construction activities, including building materials, equipment and human resources.
- Adopting the measures necessary to rationalize the use of energy in all stages of construction, including the planning, designing and the use of environment friendly technologies compatible with local resources and conditions.

- Encouraging the use of local materials and developing alternative manufactured materials that are environment friendly, as well as enhancing the recycling and reuse of waste with a view to putting an end to the depletion of the available natural resources and to conserving the environment.

### **1-6-The impact of GATT on the building and construction industry**

The impact of GATT on building and construction industry is an issue that should be thoroughly examined. GATT allows multinational companies to operate in any member country, provided that they do so in accordance with the laws, legislations and regulations that apply to national companies. This may jeopardize national companies, especially small and medium scale ones, which shall not only be confronted with uneven competition, but their number may decline and some of them may even be completely driven out of the market. Moreover, Arab and other developing countries are under international pressure to change their economic systems. The most drastic part of such change is the requirement on the part of the latter countries to amend their investment laws to ensure completely equal treatment of local and foreign investments. Adding to that, by virtue of such amendments, the developed countries shall be allowed to dump the markets of the developing countries with foreign products; thus threatening local production and exposing it to great losses.

Therefore, it is imperative to synergize all efforts to encourage the building and construction sector to develop itself administratively, scientifically and technologically, and to urge its companies to form alliances and mergers in order to establish economic blocks that can mitigate any potential harmful impacts by international agreements. Moreover, it is of utmost importance to keep on improving the quality of the local products and ensuring their compliance with international standards and specifications. **It is necessary to reduce the cost of production while giving due consideration to packing and labeling and include production information on the products. At the same time special attention is to be given to environmental consideration and to pollution generation and compliance** with the sound and scientific management and disposal of the wastes of the building and construction industry. Furthermore, concluding agreements with the European Union and other international economic conglomerates is necessary for the expansion of the target market for Arab exports as well as for attracting foreign investment. Accordingly, efforts exerted to establish The Arab Common Market should continue, particularly that the GATT deems the intra-trade among the members of the same economic block as an internal affair not subjected to the WTO laws. Hence it would be easier for the Arab Common Market to negotiate as a block regarding the access of its products to foreign markets. In this respect, it is worth noting that the establishment of PAFTA (Pan Arab Free Trade Area) in 2005 completely liberalizes the intra Arab

trade from all tariff and non tariff barriers .Other commendable steps have likewise been taken to liberate intra-Arab trade in services; including building and construction, engineering and environmental services. In mid October 2004, negotiations among some Arab countries started with the aim of liberalizing the trade of services among them. Announcement of the results of these negotiations are expected to be made soon.

## **Second Theme: Sustainable management of infrastructure and buildings**

Integrating the environmental perspective in development policies, planning and in national development programs is a strategic target to attain sustainable development. Many Arab countries have achieved tangible development in providing and managing the components of urban development so as to ensure its sustainability. Advanced systems have been put in place to provide adequate housing for all, and measures have been taken to facilitate obtaining land and to ensure its safe tenure. Moreover, poor communities are getting more attention from governments in terms of satisfying their social, health and cultural needs. Arab countries have had particular interest in the health and living conditions of the inhabitants of these poor settlements, particularly in urban areas. Arab governments have also exerted laudable efforts to provide these poor communities with water supplies and energy, together with propagating the concept of rationalizing their use, with a view to ensure water security for all citizens in the coming few years. Arab governments have also given due regard to the carrying out of sanitation projects using the hi-tech to ensure their efficiency and sustainability.

Arab countries have not restricted themselves to only taking these successful steps in all fields , however, they further sought to attain sustainability by drawing up plans and policies for the future, to ensure more stability and progress. Following is a review of some of the achievements of the Arab countries in the field of sustainable management of the infrastructures and structural establishments, including what has been achieved at the various vital fields such as in urban planning and management of land uses on the one hand, and sound environmental management of buildings and utilities on the other. This paper also deals with the theme of development of human resources and the transfer and settlement of modern suitable technologies. For it is those technologies that constitute the backbone of the urban, economic and social development needed for the progress of the community. The paper also deals with the styles of Arab architecture which have their own characteristics drawn from and in harmony with the Arab environment. It also addresses how to preserve such architectural styles of great value for the next generation. Moreover, the paper mentions some of the know-how as to restoring buildings of importance to Arab history and heritage.

All Arab countries do have almost similar stances concerning issues relevant to property and real estate ownership. They have also unanimously agreed that safe tenure is a basic right that is guaranteed in both Arab and Islamic civilizations. In fact this right is viewed by all Arab countries as the key pillar for their strategy to achieve

sustainable human and urban development in the Arab cities in their efforts to stand up to the trends of globalization and its impact on certain groups of the community.

The Arab region is also experiencing significant changes in terms of the role of the public sector. In the past, this sector has been responsible for meeting the needs of the grass root owing to its tremendous ability to move more dynamically and to compete more freely in the market. Moreover modern trends to achieve administrative decentralization through the implementation of reform programs, and through vesting more power upon local councils and municipalities, currently play an important role in urban development, based on the fact that cities, towns, and municipalities constitute an integral part of the over all administration of the country.

It is worthy to mention here that the instability in the Arab world caused by wars and conflicts has weakened, and in fact even ruined many of the components of development as well as the stability of such development. This is particularly true in Palestine and Iraq. Moreover, civil conflicts in Lebanon, Sudan and Somalia have led to the destruction of numerous buildings establishments, utilities and infra structures, in addition to the natural disasters that have occurred such as earthquakes, hurricanes and floods, have all had their negative impact on sustainable development.

## **2-1-Urban planning and the sustainable management of land**

Land is one of the most important natural resources that may be employed to attain economic, environmental, social, urban and touristic development. Urban planning is actually the basic tool determining the optimum land use to achieve sustainable development for this important resource, and at the same time safeguard its riches and vitality for the generations to come.

The Ministry of Housing, Utilities and New Urban Communities in Egypt has, through The General Organization of Urban Planning, paid due attention to urban planning and land use at all levels; be it national, regional and local; where all local development projects are implemented by the civil society, together with the government who have participated in the preparation of such urban development plans in a true exercise of the principle of partnership in determining the development priorities, which is the only guarantee for the sustainability of such development.

The General Organization of Urban Planning has drawn a development and urbanization plan for Egypt up to 2017. Such map will serve as the main pillar in determining land uses all over the country. This project aims at attaining sustainable development through two means: the development of uninhabited desert areas to expand the area of cultivable land in Egypt from 5% to 12.5% of the total area of the

country by 2017. To achieve this goal, an integrated study has been conducted on the properties of the uninhabited land in Egypt, covering its geographical and environmental nature, the volume of water resources available in each area, its climate, its closeness to urban areas and its suitability for the different land uses. Based on this study, it was proposed to establish 44 new urban communities to accommodate more than 8 million persons by 2017. The economic basis for such communities would be agricultural, industrial or service; depending on the natural resources available. During the last twenty years, the Ministry of Housing built 20 of the proposed urban communities. The Government investment in these communities is more than L. E. 21 billion. In addition to the effective contribution of the private sector and civil society in these communities that amounts to L.E. 35 billion. More than 3500 plants and factories have been established in these new communities providing hundreds of thousand of work opportunities and accommodating more than 1.6 million persons.

Development of the peninsula of Sinai is among the most significant urban planning projects in Egypt at the regional level. Other sustainable development projects have been proposed, based on the optimum use of lands, as in the project of land reclamation, touristic and environmental development. That is besides to the creation of new well-planned urban communities that are consistent with the significance of this important part of Egypt.

Comprehensive urban planning started in The Kingdom of Saudi Arabia in 1970 when pilot plans for the cities were laid down; determining their needs of expansion and consequently their requirements of utilities, services and infrastructure projects. Urban centers, which serve as means of transferring and promoting comprehensive urban development have been strengthened.

Algeria enacted a law concerning sustainable development for the whole country that shall be applicable up to 2020. This law draws the framework for achieving sustainable development and defining the basic objectives for such development, taking into consideration the even distribution and the different activities of the population.

Urban planning in The Hashemite Kingdom of Jordan basically focuses on the comprehensive planning of cities, a task that is carried out by municipalities in accordance with the law on municipalities. For in this Arab country, municipalities play a pivotal role in the field of urban planning and the establishment of new communities as well as in specifying the standards on roads engineering and criteria of land uses, be it for housing or commercial or industrial purposes.

The environmental management of urbanization in Jordan is affected by:

- The housing sector and the role played by the General Organization for Housing and Urban Development in sponsoring this sector, in implementing housing policies and in monitoring the housing market through housing and geographical information systems.
- The issues related to the organization of land tenure and housing ownership, while recognizing the different types of ownership and the social, economic and environmental perspectives of each type, as well as strengthening the role played by the Department of Land Survey in the management and control of the land and real estate markets under an accelerated urban growth. In this respect, The Department has taken the initiative to establish an advanced information system that safeguards property rights and links land surveys with real estate registration. This facilitates the operation of the real estate market and provides basic information on this sector.
- The enactment of legislations related to land and its uses has rationalized land use and restricted the unjust waste of land and the encroachment of urban expansion on the expense of agricultural lands.
- Using geographical information systems as a legal, administrative and economic tool that helps decision makers in planning for development on the basis of the actual information on land. This information is continually being developed and modernized to facilitate the upgrading and distribution of such information.

Syria has drawn a housing strategy that included policies and executive measures to be in force after 2000. The most important action of which is the securing and preparing of land for construction; amending urban legislations, and enacting law NO 26 of 2000. Moreover the role of The General Organization for Housing has been significantly activated.

It is noting worthy that the current trend in Arab government institutions and departments concerned with urban planning focuses on promoting the concept of decentralization in the planning and management of land uses through developing the legislations governing urban planning, as well as through propagating the concept of granting local authorities and the civil society full powers to determine and carry out local urban development projects with the technical support of central authorities and mechanisms. For this is the best way to ensure that urbanization attains its objectives and is not in contradiction with other development goals at the national and regional levels.

In Yemen there is a clear political commitment towards decentralization in management. It won't be easy to effect such reform-oriented changes and implement their respective programs over night before creating cadres capable of applying the aspired full decentralization without putting it at stake. The United Arab Emirates is an example of an Arab country which has applied decentralization in urban planning. The

constitution stipulates the principle of decentralization and hence authorizes all the seven emirates to have full powers in planning their own urban development.

The authority that is directly concerned with urban development in Yemen is the central government represented in The Ministry of Planning and Development and the Ministry of Public Works and Roads. The Ministry of Planning is in charge of drawing socio-economic plans, and it performs this task through collaborating with other departments concerned with the development of human settlements. The Ministry also supervises the implementation of development programs and projects. The Ministry of Public Works and Roads is in charge of the following:

- Establishing and developing basic structures and determining the priorities of urban, environmental and housing plans for the whole country. This task is achieved by drawing up practical plans and pursuing feasible policies for the different sectors affiliated to the Ministry, and promoting the departments of the ministry with a view to keeping pace with urban development.
- Drawing up and developing a general strategy for roads and bridges, and preparing implementation programs and plans to successfully link all the cities of Yemen, maintain a balance between rural and urban areas and link boarder cities with neighboring internal ones.
- Drawing and developing a demographic strategy and preparing implementation plans and programs compatible with the community needs and potentials and with the state plans for comprehensive development.
- Conducting specialized studies and researches in the field of housing, urban planning, sanitation, and environment, and developing them in collaboration with the departments concerned.
- The Urban institutions of Yemen are: The General Organization for Electricity, Ministry of Health, Ministry of Water and Environment, Ministry of Social Security, Pensions and Social Affairs, Ministry of Education, General Traffic Administration, and Ministry of Transport.
- There are also other specialized agencies and departments engaged in the process of urban development. Their plans and programs include the general frameworks for urban policies. There are also other stakeholders in the process of development such as non governmental organizations, public associations, cooperatives, charity organizations, women organizations, trade unions and others.

In Morocco several organizations have been established to ensure the enforcement of the legislations and laws enacted to provide suitable, adequate and healthy housing for all. These include:

- The National Agency for Combating Inadequate Housing, which is now known as The Urban Development Group.

- Urban Agencies.
- Regional Institutions for Building and Construction.
- The General Real Estate Company.

Taking the demographic policies into consideration when allocating lands or paving roads is very important in terms of organizing and controlling urban expansion; as it helps solving the problems of over population of cities and of congestion in traffic, and allows for controlled urban growth and expansion in economic activities run in any city. Otherwise urban chaos would become rife, and road networks would have to be established without a clear demographic policy. This urban chaos usually takes the form of new random settlements at the outskirts of cities. In time these settlements or slums become a source of all sorts of social maladies. Organizing and controlling urban growth allows for the protection of the environment, for safeguarding urban settlements against noise and pollution and for spreading legal protection over significant historical, cultural and traditional popular areas in the Arab heritage. Therefore, a law for the conservation and protection of the environment has been recently enacted, together with the establishment of several new agencies within the Ministry of Environment.

In this respect, Egypt has taken major steps to plan and carry out the giant project of the coastal highway, which is a major project for regional development. Many coastal governorates in Egypt shall benefit and flourish as a result of this highway. These include North Sinai governorate in the far eastern part of Egypt reaching Marsa Matrouh governorate in the far west. Several new communities are planned along this highway and land has been allocated for several uses such as industry, tourism and land reclamation. It is expected that this highway shall attract citizens to this area and hence ensure a fair and even distribution of the population of Egypt.

The role played by urban planning at the local level is manifested in many of the projects developed in some Egyptian cities, such as the ring road for Cairo and Alexandria. This project shall link all the urban communities near it, ensure the optimum use of the land and lead to moving many of the unsuitable land uses to urban areas outside the residential blocks of these cities and communities.

Moreover, the development of Mansheiat Nasser district (the largest slum area in Egypt) is one of the major achievements of urban planning to develop random settlements through the application of the principle of community participation in proposing programs and deciding on development priorities. This project reflects the active contribution of the State in improving the quality of life of the low income classes.

## **2-2-Sustianable, sound environmental management of buildings and utilities**

Sustainable environmental management has become one of the basic issues to be considered whilst designing development programs. The problem owes mainly to the lack of resources and the ongoing changes in the fields of environment, economics and urbanization. Governments have become aware that sound environmental managements can not be achieved solely through human development, however, all aspects of administrative and institutional development should be considered, so as to furnish the ways and means necessary for ensuring a sound and proper environment for buildings and utilities. These include: -

- The infrastructures, potable water networks and sanitation, electricity and road networks.
- Green areas.
- Social and health utilities and services.
- Environmentally sound ways and means for solid waste management.

With regard to the natural environment, the sites allocated for housing and utilities should be located away from:

- Polluted areas.
- Waste dumps.
- Airports.
- Laboratories and industrial zones.
- Hazardous naturally sensitive locations.

Kuwait has prepared plans for the cities of Arifagan, Jaber and El Kheiran to ensure their sustainability. UAE has drawn a master plan for the future development of many cities such as Abu Dhabi, El Ein, Dubai and Al Sharja, keeping in mind the standard environmental specifications.

It is worth noting the importance of applying the standards for sound environmental management and quality control in all building and construction processes, as well as in the implementation of urban development projects.

To ensure a sound environmental management for buildings and utilities in Morocco, several legislations and regulations have been enacted for the internal and external protection of buildings and utilities. These include:

- Decree No 1914 concerning the hazardous, unhealthy, and difficult utilities, such as commercial or industrial establishments. The legislator has classified these utilities into three categories according to the extent of their hazardous impact or potential harm to the health and safety of the citizens.

- Decree No 1533 which amends and alters Decree 1914 concerning the hazardous, unhealthy, and difficult utilities.
- Decree No 1952, 1941 and 1992 concerning residential blocks and neighborhoods. These legislations define the necessary measures and procedures that should be applied in the preparation of land for construction and building.
- Laws that determine the necessary health prerequisites for new buildings such as:
  - Law No 1516 concerning road networks.
  - Decree No 1977 concerning the restoration of houses.
- Ministerial decree No 1953 determining the heights of residential buildings.
- Decree No 1964 defining areas for economic housing projects and providing for the laws that govern such areas.
- Decree No 1938 dealing with the environmental protection of cities, and urban centers.

Algeria has established specialized institutions to follow up the implementation of environmental policies. These include, The National Observatory for Environment and Sustainable Development and the National Agency for Waste

In 1995, Tunisia had established The National Observatory for Environment and Sustainable Development. One of the most important publications of this Observatory is its first Annual Report on the Indicators of Sustainable Development in Tunisia for 2003.

In Yemen, The Council for The Protection of The Environment has been established in 1990 by virtue of Decree No 94. This is an administratively and financially independent body. This step on the part of the state reflects its sincere endeavor to protect the environment and to safeguard the natural resources so that they may accommodate and serve future generations, and to achieve comprehensive sustainable development. Thanks to this council, issues related to the protection of the environment now have distinct priority in all development agendas. Moreover, a Ministry for Water and Environment has been established in the new cabinet of 2003; thus reflecting the profound interest of Yemen to safeguard, conserve and protect its environment.

Several projects have been established to ensure the sound management of the environment. These include:

## **Upgrading of Slum Areas**

In Egypt, several projects have been implemented on infrastructure, highways, roads, services and the upgrading of slums areas to develop the urban block and restrict its unplanned growth. It has been noticed that the growth of random settlements usually comes at the expense of the surrounding agricultural lands; thus posing a serious danger to this vital natural wealth which should be preserved for the generations to come.

## **Projects For the purification of water and the treatment of sewage water**

Egypt has implemented a huge project for the treatment of sewage water at Al Jabal al Asfar region at the outskirts of Egypt. The project is made up of three treatment plants the capacity of each is one million cubic meters a day. The project is considered a major environmental achievement by all means. The treatment of sewage water is conducted in accordance with very sophisticated complicated biological reactions, and therefore should take place in a sequence that is determined by certain time limits. Any error in this sequence necessitates the repetition of the whole process anew. Consequently the project has to be managed and operated in a strict, scientific and advanced manner that does not allow for any disruption of the system; that is to avoid the blockage of the treated water. The automated treatment plant is computerized and run by a highly qualified company that ensures the sound management, operation and maintenance of that giant project.

Some of the positive results of the project are (The treatment of 3 million m<sup>3</sup> daily):

- The possibility of reclaiming about 50,000 Acres with this treated water.
- Producing electric energy that amounts to about 18.56 Megawatts to be used in operating the plant. This generated power equals about one third of the energy needed for the project.
- The production of about 600 tons of organic fertilizers daily,

Algeria also established The National Department for Sanitation which is in charge of operating the infrastructure for the collection and treatment of sewage water. Moreover, a program for the construction of sewage treatment plants for 14 urban settlements has been completed between 2001 and 2003.

The productive capacity of the desalination plants in The Kingdom of Saudi Arabia has been augmented from 20,000 m<sup>3</sup>/day in 1997 to 2,9 million m<sup>3</sup>/day in 2004. Moreover the number of dams that have been constructed up to 2004 amounted to 223 of diversified sizes with a storage capacity of 836 million m<sup>3</sup>.

## **Pollution Combating Projects**

Many countries have taken numerous measures to combat industrial pollution so as to protect the environment. For example, Egypt exerted serious efforts to help industrial establishments in the city of The Tenth of Ramadan to comply with the environment laws and regulations during the period 1999 to 2003.

- A piece of land in the south west of Cairo with an area of approximately 607 Acres has been allocated for polluting activities (public waste dumps, plants for waste recycling and fertilizers production, and public landfills) The plan of the area was approved by the New Communities Organization in July 2002.
- The Supreme Committee for Utilities has approved the allocation of an area of 150 Acres for the establishment of an integrated project for the disposal of solid waste. At present coordination between the Ministry of State for Environmental Affairs, The Board of Trustees, and The City Administration is underway to prepare a plan for the recycling of garbage and hazardous and non hazardous solid waste.

## **2-3- Specificity of Arab architecture and means of restoration of historical and traditional buildings**

Arab architecture is considered one of the oldest architectures known to man, deriving its roots from history, orthodoxy and Islamic heritage. Hence, it is of paramount importance to preserve the distinctive architectural style in Baghdad, Samara, Cairo, Damascus, Muscat, Granada and other Arab ancient cities.

Many monuments featuring unique architectural styles such as Shpam Hadramout, old Sana'a in Yemen, Petra and El Salt in Jordan have survived to the present times and have been classified among the wonders of the world, some have even been classified as sites of human cultural heritage.

Yemen is characterized by a special architectural style which is reflected in many of its historical cities such Maareb, Zobeyed, Old Sanaa, Shpam Hadramout which are among the oldest high buildings built with mud in a unique and artistic style. The religious and Islamic character have played a prominent role in the shape of houses and settlements which are centuries old, as in Negev, Karbelaa, Old Sana'a Shpam Hadramout . These buildings are characterized by the following:

- The influence of the economic factor, namely the use of natural construction materials such as stone, mud, wood and gypsum.

- The horizontal, not the vertical construction, which manifests the great role of the social and traditional factors.
- The dependence on natural resources, the rationalization of energy, the preservation of a regulated temperature inside the buildings in summer and winter by placing the buildings in a suitable direction, and the use of natural building materials (Example-Old Sana'a )
- The use of available natural material,
- Waste water of some buildings has been used for the irrigation of adjacent gardens such as ablution water from mosques.

While the Arab civilization played a role in transferring the Arab architectural styles to the countries that fell under the conquest of Islam, the Ottoman rule of the Arab countries caused the destruction of many ancient Arab monuments. However the Ottoman rule has left its imprint on Arab and Islamic architecture in Yemen and in other Arab countries.

Following are the steps taken by Yemen to preserve its historical monuments and heritage:

- Conducting excavations for antiquities, historical and cultural buildings; and examining these buildings thoroughly by using modern technologies.
- Enacting laws and legislations to govern the preservation of these monuments.
- Determining the materials used in the building of these monuments to use the same materials in their restoration.
- Organizing seminars for promoting public awareness of the value of these monuments, and teaching school students the importance of the preservation of the heritage.
- Contacting relevant international organizations to seek technical and financial assistance for the preservation of these monuments that constitute an important part of the heritage.

The reconstruction of old Sana'a city on the same old style, as well as Shpam Hadramout, Maareb, and Cairo citadel are some of the best examples of preservation through the application of the above mentioned techniques.

In Morocco, there are thirty ancient cities representing the intensive population pattern. The landmark of these cities is the traditional house closed to the outside, where ventilation and lighting are provided through the indoors court yard. Despite the similarities, difference between these cities lie in their history, their formation, their basic political, religious and economic role their sizes, the topography of their location and the prevailing colors ; white, blue, etc.

At the early twentieth century, aspects of infrastructure were introduced in these old cities, including for instance networks for electricity, sewage and running water. An urban policy was devised based on the full respect of these cities, and new cities have been constructed outside the ancient walls of the old urban fabric. At the same time policies have been adopted to protect this heritage; such as law No 1941 for the protection of buildings of particular significance to the Moroccan art and history which was amended in 1945 to include the protection of cities of special architectural value. This is to be followed by the categorization of the major ancient sites: boundaries, city entrances, schools and mosques as historical monuments. Moreover, the distinguished cultural and rural monuments will be well preserved.

In the framework of preserving the historical monuments in the Kingdom of Saudi Arabia, the area of Kasr Al Hakam, the compound of the Islamic Law courts, the General Secretariat of Riyadh, the police headquarters of the district of Riyadh in Riyadh city and the Governorate have all been re-innovated. The buildings in the Baldha region in Jeddah have also been restored and preserved.

This process necessitates preserving the ancient cities while maintaining all their features and original structures, such as shelters, traditional crafts and trade. This can only be done by specialists and requires the consultation of highly qualified handicraftsmen in the areas of traditional restoration.

Therefore, the role of construction, consultation offices and architectural engineers comes in to work in a new framework to meet this challenge. Their intervention in maintaining these ancient historic details will give rise to several questions regarding the building material, the techniques applied, the types of building, and the measures and standards to be observed in creating these urban spheres and architectural peculiarities.

Some of the techniques applied to restore the ancient and cultural buildings are:

- Producing traditional building material similar to the ones originally used.
- Conducting several studies about the preparatory designs, sources of finance, traditional rehabilitation and implementation, environment conservation, building material specification, and the leading roads and ways.
- Re-innovating the private houses through the contributions of their owners.
- Specifying all the technical, administrative, social or legal obstacles, and defining solution approaches.
- preparing technical files, conducting architectural and archaeological studies and collecting data on the current situation.
- Re-enforcing the bearing walls and fortifying the supporting columns
- Evaluating the land at the site's location.

- Making meticulous maquettes.
- Re-creating the missing handicrafts and decorations using skilled labour.
- Cleaning the site and removing the debris from the location.

In the framework of Egypt's endeavours to preserve its archaeological historic monuments, specialized agencies have been established to implement several projects examples of which are: -

### **1. CULTNAT-Center for the Documentation of Cultural and Natural Heritage in Egypt.**

The activities run by CULTNAT include; *inter alia*:

- **The Egyptian antiquities map:** CULTNAT has established a system that allows for the listing and documentation of the sites of antiquities in Egypt by using state of the art technology such as the geographical information system (GIS).
- **The natural heritage of Egypt:** This is a data base on natural reserves and diverse habitats as well as detailed information on the fauna and flora, the geological formation and distinctive characteristics of the cultural monuments in these reserves and organizing them in data bases.
- **The civilization panorama:** A number of various show rooms were set up in CULTNAT, including for example an exhibition of projects, art expositions, a folklore hall, a planetarium, and a civilization panorama.

### **2- The Executive Body for the Renovation of Cairo Islamic and Fatimid Districts**

AN executive body was established by virtue of the Ministry of Urbanization decree No493 of 1990. Among the projects presently undertaken by such body is the re-planning of al Gammaleya district in old Cairo through an urban construction perspective. The renovation of monuments at the access of Al Moez Ledine Allah street and the surrounding streets and lanes is now under way; in accordance with an ambitious plan. This project is due to be completed by the end of 2005. Meanwhile, the northern wall of the old city of Cairo is still under restoration.

### **3- The comprehensive development of the city of Luxor.**

The Ministry of Housing, Utilities and New Communities in cooperation with the United Nations Development Program has prepared a project for the comprehensive development of the city of Luxor with the aim of drawing up plans for the urban, economic, and touristic development of the city through the preservation of its

environment, so that it may become an open museum for ancient Egyptian, Islamic and Coptic monuments.

#### **4-Development project for Al Darb Al Ahmar District**

##### **- Al Azhar Park Project**

The site of the park was chosen in a place in old Cairo that is surrounded by the hills adjacent to Salah Salem highway, near the citadel of Saladin, and the Cairo Ayoubide wall which has been discovered recently and which lies near El Darb El Ahmar district. The site has given rise to some technical challenges as it was used as a dump for waste and garbage for almost five hundred years. Preparatory work for the project required digging, leveling and filling up as well as treatment of the soil. The characteristics of the park are based on the traditional use of public areas in the Islamic framework. This is manifested in areas in the park that have been prepared in the traditional garden style and the shaded seats model (El Takhtabouch) or the covered passages, (Elbawaki) arcades of the Fatimide style, such as the three modern buildings (the restaurant, the coffee shop and the entrance of the park).

##### **- Restoration of the Eastern Ayoubide Wall of Cairo**

When the park project commenced in the mid nineties, openings in the buried wall were the only visible part of it. But as the excavations of the wall became fifteen meters deep, a part 1.5 kilometers long was discovered together with the splendid towers. This triggered a tremendous process of restoration and maintenance of this monument in accordance with international standards. Work started in 1999 to restore 1.5 kilometers of the eastern part of the Amawide wall and it shall continue up to 2007.

The Agha Khan Cultural foundation managed the restoration work in this wall adjacent to the park in coordination and collaboration with the Supreme Council for Antiquities in Egypt. Other parts of the Ayoubide wall are located to the north and west of the park, and these are being restored by the Supreme Council of Antiquities.

##### **- The Economic and Social Development of El Darb El Ahmar District**

El Darb El Ahmar is considered one of the poorest and most populated districts of Cairo, lacking the essential services due to the fact that the rents are extremely low, the absent owners barely invest in fixing or maintaining their property; thus leading to the collapse of ceilings, walls and foundations, and consequently creating many pressures on the historical buildings. Together with other institutions, non governmental organizations, representatives of Cairo governorate, the district authorities, local businessmen and the inhabitants, the Agha Khan Cultural Foundation

participated in conducting studies on the economic, social and environmental requirements of the local community. Through consultations with local inhabitants, a list of priorities was set including training, environmental and health services, maintenance and rehabilitation of houses, financing of micro enterprises, garbage collection, primary health care, in addition to the establishment of a local community center and others.

Sixty five distinctive buildings of the district dating back to the middle ages have been restored. Also many private houses of unique style have been rehabilitated. A training course has been devised to enable the local inhabitants to acquire different skills in the field of construction.

The United Arab Emirates has exerted intensive efforts and conducted in depth studies to select some historic urban blocks, markets and unique buildings for preservation. It also implemented a practical program for their restoration and preservation. There has been a restoration of about fifty ancient houses, and some rare historic buildings, as el Sharja city market, some mosques, towers and forts.

These above-mentioned projects emphasize the interest of the Arab countries to preserve their heritage and to benefit from the cultural heritage in urban architectural design that provides aesthetic and functional aspects, and takes into consideration the use and sustainability of resources, and environment conservation.

### **Third Theme: Methods of developing the building and construction industry:**

The Arab governments are currently adopting sets of policies designed to develop the building and construction industry. They are based on developing the roles of all the bodies involved in this industry at the levels of both policy making and policy implementation. The building and construction industry develop not only with the growth and the development of the service providers, including contractors and manufacturers of building material, but also with the government ability to draw up policies designed to encourage and develop the building and construction market. The meant industry also develops by supporting and paying greater attention to the role of; and linking this industry and its research needs with the annual research plans of universities and research centers; which comes in line with the current trends prevailing in the field of building and construction.

The intertwined nature of the building and construction industry affects many industries and economic activities. Accordingly, it is of paramount importance to integrate the economic, social and environmental aspects in the sustainable development of building and construction. The Arab governments are working for coordinating several areas for the development and growth of the building and construction industry. They are also trying to have access to new domestic and foreign markets by adopting policies designed to develop and upgrade their human resources and to transfer and adapt modern technologies in order to be more competitive in foreign markets. The League of Arab States supports the technical efforts made to modernize the building and construction industry and to unify the Arab building system with a view to regulating the building industry at the Arab level.

Databases for the building and construction industry were established in some Arab countries and they are being periodically updated in order to enhance the competitiveness of Arab products in foreign markets. The data is available to all the authorities concerned at the domestic, regional and international levels. Accordingly, the role of the specialized Arab bodies and research centers is growing to help disseminate research studies and policies on the development of the building and construction industry in Arab countries. The role of the regional, international and other organizations; namely the Arab Housing and Construction Ministers Council, is important since they serve as pools to accumulate achievements, experience and lessons drawn from Arab countries.

### **3-1- Coordination of human resources and transfer of suitable modern technologies**

Many authorities are concerned with the building and construction industry at the national level; including the legislative bodies, which make statutes, laws, legislations and systems, in addition to chambers of commerce, federations of industries, contractors unions and the Arab Cement and Building Materials Union, trade unions and research centres. It is of utmost significance to have good coordination between all the effective bodies in this sector to achieve the effectiveness of the state strategy in enhancing the competitiveness of the building materials and the construction industries, and considering the importance of this sector as an important economic one.

At the Arab level, we are still at the beginning of a long road ahead. However, there is a strong will to develop the building and construction industry. The Council of Arab Housing and Construction Ministers is making great efforts in the following fields:

- Approving specifications, and standards at the level of the Arab region;
- Defining statutes classifying and regulating the work of architecture offices and contracting companies;
- Transferring technology and sharing experience in the field of building and construction.

### **3-2- The role of universities, research centers, trade unions and other bodies concerned**

Universities and research centres are the two wings of the scientific movement in the Arab world. While universities are primarily concerned with the academic aspect of sciences, research centres are concerned with the practical, applied and field-based aspects of sciences.

With regard to the specialized research centres, there are more than twenty research centres and institutes in charge of conducting studies and researches in various fields including the building and construction industry, especially regarding building materials. These centres and institutes have issued a number of researches, which contributed, to innovations and developments, to the removal of obstacles and to qualitative improvements in this respect. Besides, every Arab country has one university or more with affiliated research units.

#### **The role of universities can be seen as follows:**

- Qualifying university students: Making available all the specializations relating to the building and construction industry and the required curricula and educational aids to qualify cadres capable of steering this vital sector.

- Continuously reviewing and upgrading the curricula to keep pace with developments in all sciences related to the building and construction industry.
- Making available training and capacity building programs for architects focusing on practical application to make use of new and modern developments.
- Designing postgraduate studies for architects to enhance their scientific capabilities.

**The role of the specialized research centres includes:**

- Activating scientific research and directing it to developing the building and construction sector in coordination with the responsible bodies with the aim of addressing the problems facing this sector and developing methods of extraction and production of materials including means of execution and equipment which enhance the efficiency of production, reduce loss and increase the growth rate of this sector.
- Making available specialized consultative centres to offer consultancy services necessary for preparing productive projects as well as improving the quality and methods of performance and providing the required information and services.
- Preparing and organizing scientific regional and international conferences for researchers and those concerned with the building and construction industry in order to discuss the outcome of scientific research and to get acquainted with what is new with the aim of updating and developing the different constituent elements of the construction industry.

**Unions play another role in parallel with that of universities and research centres as follows:**

- Holding short training and scientific courses for architects in all specializations.
- Following up Arab and international conferences and supporting architects to participate in them.
- Coordination with concerned authorities and universities and research centers in preparing the architectural systems and specifications of the building and construction works.

The research centres, institutes and universities have contributed to research and development but their contributions remained modest and limited in several Arab countries due to the limited financial resources available to the centers and universities. The research and development share of the Arab countries' budgets is meagre. Besides, their work does not receive moral or material support from official or non-official authorities. Apart from that, relations between the research bodies and the industrial sector are almost non-existent; a matter that alienates these bodies and makes them out of touch with reality.

The number of Arab highly qualified scientists who immigrated to the US during the third quarter of the previous century reached one quarter of a million in different scientific disciplines. This led the US to save \$13.7 billion. A recent study by the Arab Industrial Development and Mining Organization revealed that the Arab scientists migrating to the west represent about one third of the total scientific cadres migrating to Europe. The US, Britain and Canada attract 75% of migrating Arab highly qualified scientific cadres. It is worth mentioning that these cadres cost Arab states about \$11 billion and are still costing them about \$1.5 billion annually.

Apart from the research centres, institutes and universities, Arab bodies (organizations and specialized unions) conduct studies and research.

Establishing channels between these research institutions, universities, centers and specialized Arab bodies is of paramount importance to building an Arab integration that achieves a sustainable development of the building and construction sector. For the realization of this demand, the following steps must be taken:

- Establishing an Arab union for the Arab research centres. This issue is being studied by the Council of Arab Economic Unity.
- Setting up coordination committees among the Arab union of research centers, (in the event of its establishment), the Arab Universities Federation, concerned unions and specialized organizations to draw up plans that would help link research to the building and construction industry.

### **3-3 Integration of the socio-economic, cultural and environmental perspectives within the framework of sustainable building and construction development**

Construction is no longer a mere establishment of a group of buildings and a division of land into streets, factories and buildings. For construction to be sustainable, it must be an integrated, coherent and harmonious package in all its economic, social, cultural and urban aspects, while at the same time, preserving the general framework that suits the environment, its boundaries and its capacity to absorb the building and construction processes. In other words, sustainable construction and urbanization is a balance between achieving the objectives of a better life for people without wasting the rights of the coming generations.

This is not an easy process; it is an extremely complicated one owing to the intricacy of its components and the difficulty of understanding the interrelation among those components. Innumerable problems have emerged given the limited resources and the fierce competition, in addition to the hard urban reality in many Arab countries which owes to the lack of adequate planning and a one-sided view of construction. This is

clearly manifested in the spread of informal areas in the old and heritage districts, as well as the presence of industrial areas inside cities and densely populated conglomerates. These problems entail putting strain on public utilities, shrinkage of green areas and the prevalence of several environmental problems.

For Arab construction to achieve its aspired objectives, namely the optimal use of its resources and sustainable urban development, certain factors must be available; starting from replacing the one-sided way of thinking with a global outlook that keeps into account all the sectors that impact construction. This must be done through modern planning and implementation mechanisms in line with this thought and based on a futuristic vision, sustained dynamism, comprehensiveness and realism in order to be capable of understanding the intertwined and contradictory relations between sectors.

The main determinants which should be kept into account for an integration of the economic, social, cultural and environmental sectors in planning for sustainable building and construction may be summed up in the following:

**First: The Economic Sector**

- Actual and future needs.
- Market study.
- Availability of other economic factors (infrastructure, complementary industries, and agriculture...)
- Economic feasibility study (sustained economic return, cost, and available resources, labour force...)

Some Arab states have drawn up urban development strategies and schemes to develop the building and construction industry keeping into account the economic factor as a major influencing element in the construction industry. For instance, Egypt has drawn up an urban development strategy at the national and regional levels designed to preserve the agricultural land, reduce the demographic pressure in the delta and the valley, increase national income, raise the population's economic and social standard and increase the use of natural resources. The urban development strategy aims at setting up development axes, building communities outside the valley and the Delta, making use of the existing infrastructure, addressing the problem of the randomly built areas and encouraging private sector investment.

As for Morocco, the main concern of the authorities was to reduce the cost of building by effecting changes on some of the elements that affect the costs. In Morocco the high cost of energy adversely affects the building costs, which is obviously

demonstrated in the high price of cement due to the use of fuel in the production process.

### **Second: The Social Sector:**

- The general condition of the population in terms of demography, health, education...etc
- Utilizing the population skills; thereby alleviating the social problems arising from unemployment and poverty.
- What people need and want.
- The citizens' participation, with all their classes, in the building process.
- Making available the educational, health, social and other services.

The Arab states encourage the involvement of the civil society, as one of the main pillars of the development targeting the local communities through their participation together with the private sector and NGOs.

### **Local Community Participation:**

Many Arab countries adopt an approach to sustainable development based on the local community participation as is the case on Egypt. Al-Ismaylia governorate adopted participatory planning and management through a sustainable development project for the Ismaylia "centres" and city. It started in 1993 by pursuing a new policy for sustainable development with a view to achieving development through building and strengthening the ability to plan, coordinate and manage the development and environmental processes within a general framework based on participation in drawing up development plans and strategies.

In Jordan, all the local sectors were also invited to participate in defining a vision of structuring the Jarash archaeological city.

In Saudi Arabia, some ministries and government departments carried out integrated housing projects. Up to the year 2004, the number of these residential units is estimated at 250,000 unit equipped with all utilities and services.

### **Private Sector Participation:**

The Arab countries have paid attention to involving the private and civil society in all aspects of development specially housing. The role of the investors is clear in the field of housing particularly through some civil societies. In Egypt, Al-Mustaqbal Society established 70,000 housing units in six years at a total cost of LE 2100 mn. The state contribution of this sum is LE 1100 mn. The investors' role is also crystal clear in the project for developing habitats south of the valley by financing projects for utilities,

social development, services, in addition to training of workers and citizens. The aim is to raise their living standard and increase their income.

In Saudi Arabia, private sector companies built about 3,62 million residential units.

Regarding infrastructure and in order to ease the burden on the state budget, a number of projects were put to tender for the private sector in some Arab countries on the B.O.T (Build, Operate and transfer) basis; especially for roads, electricity, communications, ports...etc.

### **NGOs Participation:**

Arab countries give NGOs an opportunity to provide the services needed by the local communities through self-financing. Most Arab countries have promulgated laws governing civil work in line with their political, economic and cultural levels to serve as a starting point for enhancing the role of NGOs in community service. Voluntary societies engage in all social and development work.

### **Third: The Cultural Sector:**

In implementing housing projects, it is necessary to consider the need of the population concerned, in terms of:

- Their purchasing power.
- Suitability to the local culture.
- People's lifestyle.
- People's cultural heritage.

Some research centres in a number of Arab countries conducts researches of this type to assess the actual needs of the people putting into consideration their life styles and cultures. The objective is to integrate the needs in the organizational process of construction and building.

### **Fourth: The Environmental Sector:**

- Minimizing the pollution caused by urbanization
- Rationalizing the use of resources, especially water resources.

In view of water scarcity, it has become imperative to rely on treated sewage water for agriculture; either indirectly by dumping it into agricultural spills, or by mixing and reusing it according to specific standards. Another possibility is to carry the treated water and use it for irrigation or for desert reclamation in areas appropriated for this purpose. The Arab Republic of Egypt adopted in 2004 the Egyptian system for using treated sewage water in agriculture.

- The suitability of urban areas to the physical environment.

- Adopting a sound geographic orientation of buildings and using natural building materials (old Sanaa) to maintain moderate steady temperature inside the buildings in summer and winter and making use of natural light.
- Using new and renewable energy and improving the efficiency of energy use in buildings.

The State of Kuwait has adopted an energy system for buildings, and the Arab Republic of Egypt has finalized a system for improving energy efficiency in housing units. Work is underway to finalize a system for commercial buildings to be concerned with laying down the basis and conditions for heat comfort, better internal ventilation and natural minimal light in vacant areas. This is coupled with a clarification of how to implement the required criteria by good designing of the external parts of buildings (direction, heat insulation, ratio of ventilation area to facade, shading etc). In addition, designing must meet the requirements of conditioning, light and electricity.

Egypt has launched a practical experiment on the use of solar energy in remote areas uncovered by the electricity network. Ecolodge hotel has been built in the Siwa Oasis in the Western Desert which entirely depends in its operation on new and renewable energy. The experiment proved to be a great success. It is considered to be a practical application of the concept of green architecture that integrates and suits the surrounding environment in terms of site planning, building designing and choice of building material. It also eases the ecological strain and reduces waste of natural resources; thereby ensuring sustainable development. The majority of Arab states are advocating the concept of green architecture via the activities of NGOs and offices specialized in making an ecological impact assessment of projects.

- Using local building material and local building techniques and patterns on one hand and preserving the local architectural heritage on the other.
- Using environmental friendly materials in building and encouraging the reuse of waste water as well as depending on clean and renewable energy sources like solar energy.
- Capacity building for building companies to apply the environment management systems (such as ISO 14000) in building operations : starting from the stage of preparing the site to the clearing process after the completion of the building.

So far, many Arab countries have made tremendous efforts in this respect. It is worth noting that the General Department for Housing and Urban Development, which is the government umbrella for the housing sector in Jordan, is following the policy of integration in carrying out its projects. This includes carrying out work in new housing

sites for the limited income brackets, as well as developing the random housing and the poorly serviced areas. The work is carried out according to a clear and well-studied vision through successive phases of study, planning and implementation.

Most Arab countries have on top of their priorities plans for environment development primarily designed to maximize the use of the natural capabilities and features, protect areas threatened with ecological imbalance, protect natural reserves; conserve water resources against pollution and control the sources of air pollution.

### **3-4- Development of human resources and the transfer of suitable modern technologies**

The objectives of sustainable development can be achieved only when capable cadres are available to understand the concept of sustainable development and know how to use its different tools and mechanisms. Such cadres should be able to perform their task at the local level. For the greatest challenge is how to translate development objectives and programs into projects that would have a positive impact on the economy and would be well-perceived and conceived by the laymen in urban communities. It is pretty well known that the developing countries in general suffer the absence of qualified cadres that could manage development at the local level particularly as regards the ideas and concepts of sustainability that are based on citizen participation, transparency in decision making and efficiency in the management of development projects. Moreover, the developing countries are often incapable of dealing with and using modern technologies in the building and construction process. These technologies are applied in developed countries in all the aspects of development whether at the level of planning management or practical application in the various urban development projects. Training is one of the most important effective means of developing human resources and of the transfer and adaptation of modern technologies to the local circumstances and peculiarity.

- Organize training programs to satisfy the demands of the labor market.
- Establishing new training centers to cover deficiency in certain specializations.
- Promoting continuous education and training as a means of developing information and knowledge.

Developing human resources basically requires enhancing the role played by vocational and technological institutes so that they provide the building and construction industry with qualified technical labor force capable of producing quality buildings and applying the most up to date technologies. Promoting the skills and awareness of the labor force can only be attained through a large base of technical and vocational institutes. Consequently Arab countries should exert their utmost efforts to exchange their experiences and expertise and expand the base of training of newcomers in the

building and construction sector and retrain and upgrade the skills of those already employed in it.

### **3-5- Establishment of data bases on the industry of building materials**

The availability of information, statistics, and data on any industry is the base for well informed decisions regarding the laying down of sound criteria and indicators. Therefore, Arab countries should focus on establishing data centers. In fact many of them have taken long strides in this respect and have data bases that can provide sufficient information and indicators on the various aspects of the building and construction industry.

In recent years some Arab organizations, government departments, trade unions and statistical agencies have collected data on this industry. For example:

- A directory of engineering capabilities in the Arab region prepared by the Arab Council of Ministers of Housing and Construction.
- A list of contracting companies in the Arab region prepared by the Union of Arab Contractors.
- The creation of an integrated database on the industry in the Arab region and the world at large prepared by the Arab Union for Cement and Building Materials.
- Survey on the production of building materials carried by the Central Agency for Public Mobilization and Statistics in Egypt (CAPMAS).

In this respect, it is indispensable to exchange experiences between the Arab countries in order to establish a strong database through advanced centers of information. This information constitutes a major base for facilitating investments in the field of building and construction, as well as an important service provider for the construction and development systems in the Arab region in general.

### **3-6- The role of specialized Arab agencies:**

The League of Arab States exerts great efforts in this respect through the Arab Council of Ministers of Housing and Construction and the Technical Scientific Consultative Committee affiliated to it.

Moreover, the Arab Institute for the Development of Cities provides training to the personnel of Arab cities in the field of urban development. It should also provide training to expand the application of the unified Arab codes for building and construction.

### **3-7- the role of international agencies and institutions:**

The Arab countries give due regard to cooperation with all the different countries of the world; especially in the new world economic order, and in the light of the local and regional changes and developments. They endeavor to promote and strengthen international cooperation and partnerships that would be positively reflected on the human, economic and social development of the Arab region. Most Arab countries have already concluded many environmental cooperation agreements both at the Arab and international levels.

**At the Arab level:**

- In 1999, the governments of Egypt and Tunisia signed a memorandum of understanding on environmental protection. This is only one of 33 other agreements which Egypt has concluded in the field of air pollution and noise, reserves, climate, cultural heritage, desertification and sea pollution.
- In 1999, a tripartite cooperation agreement was concluded between the Kingdom of Morocco, the Republic of Tunisia and the Hashemite Kingdom of Jordan.
- An agreement was concluded between the Kingdom of Saudi Arabia and SNIC representing the Kingdom of Morocco in 2000.
- Several free trade zone agreements have been concluded by many Arab countries.
- The Network of Arab Urban Development has been established between Jordan, Algeria, Tunisia and Morocco.

**At the international level:**

- The United Nations Development Program (UNDP) has concluded several agreements with Arab countries and has implemented a number of Urban development projects in Arab cities, some are still underway.
- UNESCO contributed in conducting cultural studies on several Arab cities; particularly historic ones, including but not limited to Cairo, Old Sana'a and Hadramout.
- Protocols of joint cooperation have likewise been concluded between the European Union and some Arab countries.
- Partnership agreements with several countries of the European Union such as France and Germany have been concluded with some Arab countries including Yemen, Morocco and Egypt.
- Partnership agreements have been concluded between the USA and some Arab countries such as Egypt and Jordan.
- Agreements between China and some Arab countries such as Morocco and Egypt have also been concluded.
- An agreement was concluded between the Global Environment Facility (GEF) and Algeria to protect and operate Al Tazili and Al-Ahkazar reserves.

- Agreements between Algeria and many European countries such as Belgium, Italy and Germany have been concluded for the improvement of the environment and the disposal of waste.

We recommend enhancing cooperation and coordination among Arab, regional and international organizations and institutions to overcome the environmental challenges, besides to promoting the principle of green architecture (environment friendly). This goal may be achieved through establishing databases, exchanging knowledge and information, conducting researches and study, intensifying Arab and regional meetings to exchange ideas and experiences, and learning from success stories in strengthening the principle and application of green architecture.

**Fourth Theme: Scope of sustainable building and construction industry in the Arab region in the light of the three first themes.**

**At the National Level - Every Arab Country Shall:**

- Establish and develop a national data base on sustainable building and construction (building materials and their industry, natural and human resources, monitoring and management systems, traditional architecture, integrated management of building and construction wastes)
- Develop, modernize and upgrade building and urban planning legislations, and endeavour to set up the necessary implementation mechanisms.
- Complete the formation of national committees for the building and construction systems, and benefit from unified Arab codes for building and construction.
- Ensure that quality control standards are observed and applied in building and construction works.
- Find ways and means to apply the style of architecture that best suits the socio-economic and environmental conditions, rationalize the use of building materials, and safeguard the Arab cultural and traditional heritage.
- Develop human resources in the field of sustainable building and construction, by developing the curricula at all academic levels, including technical and university education, and holding continuous training courses.
- Encourage the merger of consultant offices and contractor companies so as to promote national competitiveness to confront the challenges of globalization and open new markets.
- Upgrade the urban environment and the services particularly in marginalized areas and slums.
- Launch public awareness campaigns on the optimum use of buildings, utilities and materials with a view to safeguarding the environment, stopping its deterioration and reducing the quantities of wastes.
- Expand the use of sustainability tools, particularly environmental impact assessment, and integrated environmental assessment of building projects.
- Give due regard to the maintenance and rehabilitation of structural establishments.

**At the Arab Level- The Arab Council of Ministers of Housing and Construction shall:**

- Set up Arab information networks on sustainable building and construction materials (industry, legislations, engineering, planning and design, consultancies, contractors, implementation, human and natural resources, research centres, administration, environmental management systems and

monitoring, traditional architecture, and integrated management of building and construction wastes).

- Exchange information, share knowledge and experience in the field of developing and upgrading buildings related legislations and implementation mechanisms, and prepare Arab directories in this respect.
- Complete the unified Arab building codes.
- Prepare an Arab guide by the research institutes working in the field of building and construction in the Arab region
- Exchange experience and share knowledge in all fields of sustainable building and construction, including the integrated management of the building and demolishing waste. This may be achieved by holding meetings, organizing seminars and conferences and conducting training courses as well as exchanging visits of experts.
- Prepare an Arab directory on the green architecture (Environmental friendly)
- Promote the preservation of natural resources and encourage integration in the building industry, including linking electricity and natural gas networks.
- Encourage the integration and merger of Arab houses of expertise in the field of engineering consultations and contracts so as to strengthen Arab competitiveness in the open markets.
- Abide by the rules of the Great Arab Free Trade Area (GAFTA) in intra Arab trade of the building and construction materials.
- Accelerate the preparation of tables of commitment, and negotiate to liberalize the intra Arab trade in the field of construction, services and related engineering services.
- Create a favourable investment climate to attract Arab investments to the sustainable building and construction sector.

#### **What is required at the international level:**

##### **From the Developed Countries:**

- Fulfil their international obligations in providing assistance and in the transfer, adaptation and settlement of environmental friendly technologies of building and construction that are compatible and in harmony with the conditions of the Arab region.
- Provide support and assistance to solve environmental problems specially pollution resulting from building and construction industry and works including monitoring, and rehabilitation systems and capacity building.

##### **From International and Regional Organizations:**

- Contribute in providing the necessary support and assistance to implement the programs and activities related to sustainable building and construction in the Arab Region.

### **From The International Community**

- Promote international cooperation and partnerships in the field of sustainable building and constructions.
- Protect the Arab areas that are under occupation and safeguard its entity, heritage, natural resources, ecosystems, urban block, infrastructures, and demographic structures; and seek to put an end to this occupation as soon as possible.

## **References**

- 1-Sustainable Building and Construction in the Arab Region- The Arab Union of cement and building materials (August 2004)
- 2-Recycling of the environment polluting building wastes and materials in Egypt, and possible ways of benefiting from it (The Housing and Building Research Center-Cairo (November 2003)
- 3-The Unified Economic Arab Report – The General Secretariat of the League of Arab States- Cairo-Egypt (September 2003).
- 4-Assessment of the Economic Cost of the Different Ways of Production of Water in The Arab Republic of Egypt. CEDARE-(December 1996)
- 5- Report and recommendations of a workshop on the environmental management of industrial zones-The General Secretariat of the League of Arab States  
30 September to 2 October 2003.
- 6- Working Paper– Sustainable building and construction in the Arab Region; The Syrian Arab Republic.
- 8- Working Paper - Sustainable building and construction in the Arab Region; The Hashemite Kingdom of Jordan.
- 9- Working Paper- Sustainable building and construction in the Arab Region; The Republic of Yemen.
- 10- Working Paper- Sustainable building and construction in the Arab Region; The Kingdom of Morocco.
- 11- Working Paper- Sustainable building and construction in the Arab Region; The United Arab Emirates.
- 12– Working Paper- Sustainable building and construction in the Arab Region; The Popular Democratic Republic of Algeria.
- 13- Working Paper- Sustainable building and construction in the Arab Region; The Kingdom of Saudi Arabia.
- 14- Working Paper- Sustainable building and construction in the Arab Region; The Republic of Tunisia.
- 15- Working Paper- Sustainable building and construction in the Arab Region; The State of Palestine.
- 16- Working Paper- Sustainable building and construction in the Arab Region; The State of Kuwait.
- 17- The Eighth Conference of Kuwaiti Industrialists-(January 2002)
- 18- State of desertification in the Arab Region- ways to deal with it; CAMRE; League of Arab States and UNEP (March 1996).
- 19- Compendium of projects executed by CEDARE for the Arab Region; Center for Environment and Development of the Arab Region and Europe (March 2002)
- 20- African environment outlook; UNEP (2002)