

## **Reforms in Urban Planning and Development Process: Case of Uttar Pradesh, India**

<sup>1</sup>Vijay Kumar, <sup>2</sup>Dr. R.K. Pandit

### **I. INTRODUCTION**

Growth of any urban settlement is governed by the needs, aspirations and requirements of its habitants rather than the enforcement of development plans, zoning regulations and the bye laws. The urban settlements are regularly subject to dynamic social, economic, political and technological dynamics. The success of any development plan depends on the quantum of proposals being implemented and the acceptability of the habitants without any confrontation, and how much of expectations and aspirations of residents are fulfilled. Level of provision of adequate physical and community infrastructure and improvement of quality of life is the index of success of any development plan.

Urban planning is the process in which all the physical developmental activities of a town are controlled, regulated and monitored from time to time. These processes are formulated and envisaged in the form of a comprehensive plan, broadly known as "Master Plan". It is a statutory requirement for every city before implementation of any development proposals. It deals mainly with two aspects: Landuse information, and development guidelines. In India, State Town and country planning departments (TCPD) are the nodal agencies responsible for preparation and implementation of this plan. This plan has to regulate all physical development proposals and planning guidelines within the city.

The Master Plan is an instrument to achieve these objectives. The city is a corporate entity which is administered by local government. The local government of the city has a great deal of influence on the nature, extent and manner of development of the city. The various utilities, services and facilities provided by the Center, State and Local governments affect the urban environment. The local government has to co-ordinate the various decisions which affect the physical development of the community. The local government needs some technical guidelines in making its decisions. It requires a legal and technical instrument for long-term, short-term policies, programmes and strategies for the orderly development of the community. This development plan provides such an instrument.

### **II. URBAN PLANNING**

An urban planning program may be divided into four basic stages: formation of goals and objectives, basic research/available data / study of existing scenario, plan preparation and plan implementation.

The basic stage, a general statement of community goals and objectives, allows a planning agency to express the general values and goals of the citizens, in regard to future development. By this statement a consensus of future development policy can be formed, as it indicates, broad objectives, how they can be realised and also it provides guidance for the formation of plan.

Efficiency of a plan depends on the accuracy of basic information on which it is based on. So the second part is basically the collection of available data, condition, further it is analysed. This analysis should reveal the community needs and problem.

After the goals and objectives have been stated and the research accomplished a plan can be prepared. This plan tries to indicate how private and public action can achieve certain community goals and policies in next 10 to 20 years. A plan synthesizes the available information and proposes various ways to meet specific problem.

A plan is not a rigid design of the future, it suggests solution to specific current problem and to those future problems that can be foreseen. It is a program for action and a guide to future development. For it to be effective, the community must carry out not in next 10 years, but continuously.

If a plan is viewed as a direction for action its success depends upon the way it is implemented. One way the plan can be put in to operation is by public action, if a community builds its public building and its civic developments in accordance with the plan much can be carried out in the proposal of the plan. Private action is also important in effective implementation of the plan. The plan can mould private development in two ways, by regulation such as subdivision regulations, and zoning, ordinances, requiring minimum standards of development and by influence on private citizens to develop their land in accordance with broad community objectives, benefiting the developers and the whole community.

To be effective a plan must be revised periodically, such updating, to make it compatible with changing conditions and an ever useful document for public and private bodies, is a primary task of planning agency.

Process of Preparation of Master Plan: As Per Uttar Pradesh Urban Planning and Development Act 1973.

#### **VARIOUS STAGES FOR PREPARING A MASTERPLAN**

- STAGE – I: First of all, government **notification** is done to prepare the Master Plan of a city. Local planning authority is responsible to make the master plan, but if local planning authority can't make the plan, the government can get it prepared by the state town planning department; the cost incurred is to be recovered from the budgets of the local planning authority.
- STAGE – II: After it is decided that a master plan is to be made, the next task is to decide **objectives** of the master plan. These objectives are directly taken from the town planning act of the state, under which the master plan is to be prepared.
- STAGE – III: Then, **surveys** of existing conditions of that city is done and data base is prepared for this both primary as well as secondary sources are tapped.
- STAGE – IV: Once a **data base** is prepared, the next stage is to analyse the data and based on the same, future projection are made for the plan period.
- STAGE – V: This stage consists of preparation of the **draft master plan** which consists the existing and proposed – **landuse maps, transportation network, facilities and amenities, density pattern, phases of development** etc. Apart from these the draft master plan also contain report containing formation of regulation and zonal regulation are also included in it.
- STAGE – VI: After preparing the draft master plan, the concerned agency publishes it widely and **objections and suggestions** are invited from the public and other authorities, upto a certain date.
- STAGE – VIII: Then this finalized draft master plan is submitted to the **government** for **approval**. The government can approve the master plan as it is or it can propose further modifications, which the concerned agency has to incorporate and re-submit to the government for approval. The government has power to the reject the master plan and to ask the concerned agency to prepare the draft master plan afresh.
- STAGE –IX: In case of the draft master plan being approved by the government, it s considered to be the final master plan and then concerned agency publishes it for the open reference and sale. On the very date of **publication** of the **final master plan** it becomes **operational**.

There can be minor variations in the above mentioned skeleton, for individual case, but overall process remains the same.

### **III. Uttar Pradesh Urban Planning Process Compared To The Western Urban Planning Process**

Uttar Pradesh Urban Planning process is heavily influenced by western planning process concept but there are certain inherent variations at the very concept.

- In Uttar.Pradesh the whole process of plan making is strictly regulated by the legal frame work. More so, planning agencies also do not exert more than what is required for the satisfaction of the legal frame. This may be due to the lack of motivation from the decision makers and insufficient infrastructure to produce more comprehensive plans.
- The very beginning is done by making a set of objectives, which are directly taken from the contents of the act, under which that plan is to be made. This may be taking care of the basic obligation of the constitutional frame work, which is the social welfare, rather than the economic gain, but deliberately nothing is included in the set of objectives which might otherwise be necessary for the overall development of the city.
- Here, this is not meant that one should be appreciating the western concept only and making critical remarks about the Indian practices, but the intention is that to point out the gaps in the very inception of a master plan, for a city, which would basically be aiming for the overall development of the community. Moreover, the Indian cities are entirely different from western cities; hence western concepts are not at all viable for the Indian context. In western system continuous monitoring, evaluation is done regularly and in the west they carefully see that the plan is actually executed properly. Reasons for regular monitoring and evaluation and modification is done because they have better infrastructure strong political will Appropriate number of skilled labour, finance, professionals In west public participation is done at a very beginning of plan generation process or at of preparing the master plan
- But there are glaring gaps in the very conception of objectives of the Master Plan.
- The next is the preparation of one and only one draft master plan, to achieve the set of objectives, which is considered to be the optimum plan for given set of parameters. This is one of the major deviations from the western planning process. The various alternatives are considered at the draft master plan preparation stage

but, these alternates are thought of at the individual proposal level and no alternate Master Plans are made, as is done in west.

- This means, at each individual proposal level several alternates are thought of and the most appropriate is finalized to be included in the draft master plan. This in a way, can produce an optimum plan, but it omits the opportunity of having alternate plans and then deciding which one to choose. Both are two absolutely unique ways to prepare a master plan and both have their plus and minus points, which method is most appropriate, is very difficult to tell. But obviously for Indian conditions, former one sounds the best, as it requires less input in terms of time and resources.
- The next stage is the public opinion on the proposed draft master plan. This serves the need of public participation in Indian context. This kind of public participation is also quite different the public participation is used at the every preparation stage of the master plan, while in India, the public opinion is sought only after the completion of the draft master plan. Once the public objections and suggestions are collected, both at individual as well as collective level, then these are considered by the plan makers and then the modifications are made, in the draft master plan.

Then the draft Master Plan is sent for final approval of the government, after which the Master Plan is finalised and becomes operational.

#### IV. Comparing Plan Generation Processes With Western Approach

S.No.	Basis of Comparing	Western Planning Process	U.P.Urban Planning Process
1.	<b>Conceptualization of the goals</b>	Based on values of the target community taking care of the aspirations of expectations of the city inhabitants	No separate mention of goals,
2.	<b>Framing the objectives</b>	Directly relating to the goals; 'Means' to achieve the goals	Mainly, taken from the legal frame work, indirectly fulfilling the constitutional as well as social obligations.
3.	<b>Public participation</b>	Direct, right at the beginning of the process and continues up to the end of the process	Indirect; after the preparation of the plan public opinion is sought
4.	<b>Plan formulation</b>	Several alternates of plans are prepared to achieve the same set of objectives	Only one draft master plan is prepared; though alternates are considers at individual proposal or policy level; the plan is considered to be an 'optimum' one.
5	<b>Evaluation of plan (s)</b>	All the alternate plans are evaluated with respect to their viability and priorities of the society; as a result one plan is chosen	No,technical evaluation of the proposed draft master plan; after making the draft master plan, it is modified as per the objections/suggestion by the public and then it is sent for govt.'s approval
6.	<b>Review &amp; monitoring of the plan</b>	After the plan becomes operational, it is reviewed and monitored periodically	No periodical review or monitoring of the plan after it becomes operation
7.	<b>Flexibility</b>	Quite flexible; scope for modification as per the ground realities during the plan period	very rigid; cant be modified in the period in mid of plan period

#### WHY REFORMS IN PLANNING APPROACH

A review of urban planning history of contemporary India reveals, that till recently, Indian planners were very much influenced by the western methods and concepts in the field of urban planning, particularly. British town planning the use of 'Master Plans' for the future development of cities is one important example. But, while in the Britain itself, from where this concept of 'Master Plan' was borrowed, this has been discarded as, not all an effective method of preparation of master plans for cities, is still, a usual practice. British town planners rejected the concept of making rigid master plans in 1968, and adopted a new method to prepare 'structure plans' for new towns. These structures plans were documents, containing broader policy guidelines

for the future development of the cities and more detailed zonal plans were left to be made by the local authorities. These were very flexible and adaptive to the future changes in technology or political policies. In India, though some of the good points of this structure plan concept were incorporated in recent master plan of Delhi, but nothing has been dropped from the problem more complex, rather than simplify it. Further, here in India, the resources are always scarce and various sectors compete for the priority of allocation of these resources. Thus, rigidity of master plans makes them redundant, once priorities are shifted, with in a plan period. Hence, recently, some policy guidelines have been induced in the process of master plan making, to reduce the rigidity of the master plan. But this adds another problem to the planning program. If these policies are not subjected to evaluation, before implementation, then undesired consequences may result in terms of unforeseen trends of development. This calls for the need of evaluation of the master plan proposals, in the planning process. Natural factors of urban growth are bound to occur and if the plan proposals are not made respecting these factors then master plans will definitely fail. The proposals are respecting this natural factor of growth or not, can only be judged by evaluation of the plan proposals, in advance. Thus evaluation is necessary for a master plan. The evaluation is also required to choose among various options available to tackle the problems of the urban systems. This choice would depend on the result of evaluation and the priorities of the society. To induce these issues reforms in present planning approach is required.

### **Recommendations & Suggestions for Reforms in Existing Urban Planning and Development Process of Uttar Pradesh**

#### **Regarding Process of Formulation of Master Plan**

- There is dire need for accurate physical, social, economic and transport surveys to prepare a practically implementable Master Plan for which modern technologies, like use of GIS, remote sensing, should be used and Master Plan should be based on accurate data.
- Presently the Town and Country Planning department of the State, which is entrusted with the responsibility of making Master Plans is not adequately equipped with sufficient man power, expertise advanced technology, equipments and funds, beside this there should be a provision such that Master Plan preparing team should have experts from the fields of Architecture, Transport Planning, Transport /Road Engineering, Conservation, Public Health Engineering, Electrical And Electronics Engineering, Geographers, Sociologists, and Economists etc. ,Master Plan should be a comprehensive effort of all these experts.
- Public participation of bodies of cities like Resident Welfare Associations, Vyappaar Mandal, Chamber of Commerce and Industries, Weavers Association, etc has to be ensured from the basic inception of the plan
- Objectives should be clear and easily understandable to common men
- There is a need for evaluation of plan before actually finalizing and after implementation regularly at certain intervals on various parameters which were the main causes of non implementation of proposals of Master plans like:
  - Technical and implementation feasibility, to check whether it is possible to practically implement the plan.
  - Financial viability, whether the physical and community infrastructure proposed in the plan are possible in present financial and funding setup and whether the projects proposed shall have adequate funds for their successful implementation, cost/ benefit analysis is also required to be done before actual implementation.
  - Social acceptability, whether the proposals are socially acceptable through social impact assessment, social cost benefit analysis
  - Physical and spatial design, whether the proposals are acceptable to people after considering the existing surveys and data's and public views.

#### **REGARDING PLANNING POLICIES**

- The Master Plan Should Propose Policy And Detailed Physical And Financial Plan Regarding Strengthening Of Physical Infrastructure VIZ:

#### **ELECTRICITY**

Appropriate amount of land has to be allocated for electrical stations/substations the preferred location has to be finalized in consultation with Electricity Deptt

Master plan should suggest Innovative measures in saving electricity , curbing wastage and theft of electricity is required. Maximizing solar passive approach in designing building, use of these measures should be made mandatory in Architectural design to reduce usage of energy.

#### **SEWERAGE AND DRAINAGE**

A comprehensive plan is required to propose scheme to develop the entire sewerage system including sewage farm in coordination with the concerned department and private participation.

### **Water Supply**

A comprehensive plan with detailed policy to meet the future water requirement is required, Measures like rain water harvesting should be made mandatory in bye laws.

### **Solid Waste Disposal**

Detailed Policy / Activity Frame Work Is Required For City Solid Waste Disposal System : Collection , Of Waste , Segregating Of Harmful Industrial Waste , Bio Degradable Waste And Non Degradable Waste .Special Provision In Zonal Development Plan Are Also Required To Develop Spaces In A Way So That They Do Not Create Any Problem To Nearby Land Uses.

- The Master Plan Should Propose Policy And Detailed Procedure Regarding Dealing With Unauthorized Growth Under Various Land Uses And Zones Specially For Regularisation Unauthorized Land uses in Large chunk of land at different locations are generally regularized without realizing any charge, In the process of just adjusting the unauthorized development huge amount of fertile land is urbanized.  
Due to faulty policy of regularizing all unauthorized development without analyzing situation case by case and without realizing any betterment charge heavy financial burden has been put on civic authorities to now provide infrastructure to these developments Such policies have further gave a strong impetus to future unauthorized growth For mixed land uses the nature and size of non-conforming uses should be studied in detail, whether harmful or unharmed ,creating noise or noise less ,generating traffic or not ,man power oriented or not , whether attracts people e.g . Stock exchange, auction spaces etc before finalizing such proposals so it should be studied intensively and classified. Only such uses should be allowed which do not have any adverse effect Reasons of unauthorized growth are also because of lack of roads and physical infrastructure especially in new areas and irrational land values. So it is the responsibility of civic authorities to provide developed land at reasonable rates and by simultaneously and phase wise developing physical infrastructure so that good amount of land is made available to the people.
- The Master Plan Should Propose Policies And Detailed Procedure To Incorporate Projected Population in the City Urban Developments have to be compact avoiding unnecessary expansion of urban limits.  
By the use of compact development cost of providing infrastructure can be reduced which is the basic need of town as most of the population comes under poor class State Housing Policy clearly advocates promotion of compact development of group housing in the towns
- The Master Plan Should Propose Policy Regarding Rural Built Up Areas/Villages Located In The Development Boundary  
There is a dire need to address this issue for comprehensive development of the villages coming within the development boundary, a special cell with in the domain of local Development Authority should be created,
- The Master Plan Should Propose Policy And Detailed Procedure Regarding Physical And Financial Targets Of City  
As a practice no financial implications have been studied while making the Master Plans, since large number of public projects are involved in actual implementation of Master Plan and a huge expenditure is required in providing roads and physical infrastructure as well as for acquiring the land specially for open spaces and greens and providing public facilities So as far as the financial aspect is concerned regarding the provision of services enumerated in the Master Plan a detailed financial report has to be prepared regarding:
- The Master Plan Should Propose Policy And Detailed Development Policy Of City In Regional Context
- The Master Plan Should Propose Strong and Clear Policy for Conserving Areas of Historical and Archeological Importance Special policy / efforts are required and integrated conservation approach should be followed.
- The Master Plan Should Propose Policy To Promote Phase Wise Development For Sustainable Growth Of Cities  
There a dire need of fixing the priority of development, division of development in phases, first phase should be the area just near the existing builtup area and until and unless first phase is reasonably completed, no permission should be given to the second or third phase.  
The idea is to have the required compact development to reduce the cost of infrastructure, external development cost and to save fertile agricultural land as far as possible.
- The Master Plan Should Propose Policies Regarding The Mixed Landuse Before applying concept of mixed land use , each road city /area has to be studied separately and following points have to be taken care of before allowing mixed land use Width of road (road widening scheme if any) Nature of amount of traffic moving on road. Bottle necks if any prevailing land uses Available parking spaces Infrastructure Tendency of growth Existing use

### **Regarding Implementing Authority and Mode of Implementation of Master Plan**

There are many reasons for deteriorating conditions of cities and non implementation of Master Plans like long and tedious procedure of making plans, out dated surveys away from the truth of ground situations and the proposals are not public friendly.

- Master Plans are generally not based on socio- economic condition and ground realities of the habitants etc but one of the prime reason of the failure of the Master Plans is the non implementation of the Master Plan proposals. Master Plans, subsequently the zonal plans., and building bye laws are not properly implemented reasons are lack of awareness in the public regarding the benefits of following the urban development regulations
- General tendency to grab the govt land may be by giving projections on public roads, constructing ramps, stairs in road
- to creating temporary structures on roadsides, display of commercials on road encroaching green buffer spaces etc
- Laxity and corruption even political intervention on the part of govt and its officers in charges of checking the unauthorized constructions

### **So A strong drive is needed to address the issue which involves following actions:**

- A drive is required to address the public and make them aware the benefits of properly following the Master Plans, zonal plans, and bye laws
- It is also important to make the regulations as per the socio economic scenario, need, affordability of common people, they should be based on ground realities, the financial status and the real ground situation as well as they should be made in such a way that they can be easily implemented with out much in convenience
- There should be a complete cell in the development authorities having a sufficient manpower to check the the physical development of entire city on at least weekly basis through its inspectors
- Townplanners should be posted at the positions of checking and controlling the physical development as well as at the level of framing the rules and policies related to physical development
- A local police staff should be posted with this cell which can assist in actual inspection of sites giving notices to the owners and restraining any unauthorized construction from happening just at the starting level
- Photography ,Videography, Aerial photography etc can also be used to record all the constructions going in a particular sector and thus a full record can be maintained and any officer while making a shift/ transfer or taking new charge shall cross verify the actual status at site with the official record so that it can be recorded as to when a particular un authorized construction has happened and who was responsible
- Support of police and city administration is direly required in order to properly make public follow the regulations
- As far as possible the unauthorized construction should be stopped at the very initial level so that it can be controlled without creating much problem to the owner and to the authority
- Process of sanctioning the plans should be made easy and fast as well as it should be easily understood by the common man
- A small court with high level jurisdictions in the matters of urban development should be established with in the development authority domain to finalize the legal cases / matters immediately
- Implementing Master Plan can also be taken as a joint venture of govt and private players which can assist public in making plans, following the building rules ,getting the plans approved quickly, and at the same time can assist authority in restraining the unauthorized constructions, check the constructions periodically and regularly

### **Suggestions for the Improvement of Master Plan Approach in Urban Planning**

It is now ample clear that in aforesaid circumstances there is a dire need for change / modification & reforms in existing system of urban development planning process:

#### **A Strong Change Is Required Through Legislation At State As Well As Central Level For:**

- Strengthening of State Town and Country Planning deptt by including experts from the field of Architecture, Town Planning, Engineering, Conservation, Urban, Design, Sociology, Economics, Management and Information Technology etc.
- Strengthening of departments through modern equipment technologically advanced manpower and facilitating to assist plan formulation, implementation monitoring and renewal/ revision.
- New act for Urban. Planning & Development. Should be flexible enough to address and suit problems & priorities of different towns with in the same frame work.

- Objectives and goals should be town specific and can address to ground problem and should be able to improve it.
- There should be an inherent system of monitoring and evaluation periodically and powers of modification of plan up to certain level should be made possible through local authorities to avoid delays.

**UDPFI team has recommended an efficient model for improving urban planning approach but still needs more deliberations in term of:**

- Regulating urban form of the city
- Catering to problems of ecology and environment
- Catering to problems of urban governance in present socio-economic framework
- Reappropriation of norms and standards required in byelaws and zoning regulation to suit lower strata of society each level of plan recommended needs further detailing of its contents and scope. Ensuring more public participation at level of plan formulation, evaluation, revision and implementation
- Urban development plan should be made a dynamic phenomenon and should be a process rather than an end product.
- Development plan should be a techno- financial document which will simultaneously guide regarding, generation, mobilization and distribution of finances.
- Under new act through legislation new institutional/ urban governance arrangement is required to provide better frame work for implementing the development plan proposals.
- Development plan has to be compatible to fast changing technological advancements, modern traffic and transportation frame work worsening environmental issues and crunching energy resources.
- New Town and Country Planning act should provide space for incorporating the provisions of 73rd and 74th constitutional amendment act, Fire Protection act, Environment Protection Acts, inclusion of Earth Quake Code 2006 and schemes like JLNURM, Special Economic Zones ,development and construction of new concepts like It Parks, Multiplexes, new types of retail market buildings.

UDPFI guidelines are perfect in the, manner that they have derived best possible solution from the western countries' practices and modified it in Indian situations, efforts are commendable but presently the mind set of indian people political thinkers, general public and even practicing and Govt. town planners that direct shifting in the new nomenclature of structure plan, annual plans ,perspective plan etc is not very much immediately acceptable they need a buffer time or buffer stage before switching over to this new system.

So using the same objective and methodology as proposed in UDPFI guidelines but by using the old terminology the development plans can be prepared though they will indirectly cater to the objectives of perspective plan, annual plan and structure plan and with same sequence and methodology.

Instead of discarding completely the existing frame of Indian Traditional Urban Planning approach, few successful earlier models and with the same terminology, can be used with modifications and objectives as suggested in the UPDFI guidelines , but based on ground realities and considering the need, affordability, socioeconomic situation and demand of common men living in the urban areas with approach promoting sustainable economic growth, providing social diversity justice and spatial equity to all economic groups

### **References**

- [1] Meerut Master Plan 1971-91 , Town and country planning Department .UP
- [2] Meerut Master Plan 2001 , Town and country planning Department .UP
- [3] Meerut Master Plan 2021 , Town and country planning Department .UP
- [4] Provisional Population totals ( Series - 25 ), paper 1 of 1991 , Census of India 1991 , 2001, Uttar Pradesh.
- [5] Ram , Sita ; " Master plans and their effectiveness , case study Lucknow , Master of Urban and Regional planning. Dissertation, 1971, School of Planning and Architecture , New Delhi.
- [6] The Delhi Development Act , 1957 ; Government of India , Ministry of Law and Company Affairs.
- [7] Maharashtra Act No. xxxvii of 1966 : The Maharashtra Regional and Town planning Act, 1966. Govt. of Maharashtra, Law and Judiciary Dept. Published by the Director General, Govt. Printing, Stationery and publications, Maharashtra State, Bombay 400004
- [8] Maharashtra Act No. IV of 1975: The Bombay Metropolitan Region Development Authority Act , 1974 , Govt. of Maharashtra, Law and Judiciary Deptt. , published by the 7. Director Govt. printing stationery and publications, Maharashtra state, Bombay 400 004.
- [9] Uttar Pradesh Regulation of Building operation Act , 1958 ; Govt. of Uttar Pradesh.
- [10] Nagar Mahapalica, Adhiniyam, 1959, Govt. of Uttar Pradesh.
- [11] 12 UDPFI guidelines, Ministry of Urban Dev., Govt ,Of India
- [12] Branch Melville , C. " Continuous city planning " , John Wiley and Sons , New York , 1981.
- [13] Chandra , Prasanna ; "Projects": Preparation , Appraisal, Budgeting and Implementation " , Third Edition , Tata Mc Graw Hill Publication Co. Ltd, New Delhi.
- [14] Chapin , F, Stuart and Edward, J. Kaiser; "Urban and Land use planning " , 3<sup>rd</sup> ed . University of Illinois Press.
- [15] Faludi , Andreas; "A Reader in Planning Theory " , Pergamon Press , New York , 1973 .

- [16] Finsterbusch, Kurt and Wolf, C. P.; "Methodology of social Impact Assessment", CDS / 32M Diwden, Hytchinson and Ross Inc. Stroudsburg, PENNSYLVANIA.
- [17] "Guide to Practical Project Appraisal - Social Benefit cost Analysis in Developing Countries", United Nations, N.y. 1978, Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi Bombay, Calcutta. (By UNIDO, Vienna).

**Author details**

1. Vijay Kumar is a Professor in Department of Architecture, D.C.R. University of Science and Technology, Murthal Haryana. He is M. Arch. Form I.I.T Roorkee & B. Arch for Chandigarh College of Architecture Chandigarh.
2. Dr. R. K. Pandit is Professor, M.I.T.S Gwalior. Dr. Pandit has a Ph. D in Construction Management (Civil Engineering), ME (Construction Technology & Management) and Bachelor's Degree in Architecture. Dr. Pandit has conducted more than 20 QIPs and training workshops for the National Institute for Advanced Studies in Architecture (NIASA) and has published more than 75 papers in national/International Journals & Conferences.