

CONSIDERATION OF ENVIRONMENTAL IMPACTS IN THE INTEGRATED MASTER PLAN FOR LAHORE-2021

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ABSTRACT: Consideration of environmental impacts in development plans is increasingly viewed as an important pre-requisite of sustainable development. Strategic environmental assessment (SEA) or sustainability assessment (SA) may be undertaken to integrate environmental considerations and sustainability of proposed policies, programmes and plans. The examples of environmental assessment of master plans being implemented in big cities of developing countries are extremely rare. This article examines the Integrated Master Plan for Lahore-2021 with respect to consideration of environmental impacts of its development proposals, since Lahore is the second largest metropolitan of Pakistan with over 7 million population facing severe environmental problems. Interviews with concerned officials of plan making and implementing agencies were held to underpin the root causes of inadequacies. The study concludes that consideration of environmental impacts is weak mainly because formal SEA or SA was not done. Lack of public participation, institutional capacity, primary data and absence of a context specific SEA process design for land use planning are some of the obstacles. Despite these, it is encouraging to note that the Plan highlights key issues of the environment, suggests carrying out environmental impact assessment and preparing environmental management plan for major development initiatives.

Key words: Strategic Environmental Assessment, Sustainability Assessment, Master Plan. Lahore.

INTRODUCTION

Master Plan is one of the instruments of land use planning which is increasingly being considered as one of the powerful tools to integrating sustainability objectives into spatial development decision making at local government level (Shepherd and Ortolano, 1996; Benson and Jordan 2004). Consideration of sustainability aspects in spatial planning is a core part of sustainable development strategy (Lee *et al.*, 1999; Eggenberger and Partidário, 2000). This can be done through assessment of possible environmental impacts of proposals contained in spatial strategies/master plans and other local documents/rules (ODPM, 2005; Vicente and Partidário, 2006). Assessment of environmental impacts is generally undertaken during the preparation of strategies, plans and rules, since these provide guidance for the spatial growth of specific regions or cities and define parameters for controlling development (Brown and Therivel, 2000; Dalal-Clayton and Sadler, 2005). Like in many other developing countries, there is no formal practice of explicitly considering environmental impacts of development plans in Pakistan. In the old master plans, environmental impacts were given least consideration. Thus, the developments were made without adequately considering environmental risks. Least attention was paid to projects with long-term environmental consequences.

These include, in particular, large-scale infrastructure projects, industrial developments, transport networks and major land use planning initiatives. Although, environmental considerations are important to be incorporated into the master plan of a city, it can be argued that the master plans prepared for several major cities of Pakistan were not environmentally sustainable due to aforementioned reasons and those cities are facing severe environmental problems (Khan, 1996). On the other hand, National Conservation Strategy and National Environmental Policy of Pakistan emphasise the “integration of environmental considerations in policy making and planning processes” for “sustainable development, and improved efficiency in the use and management of resources” (GoP and IUCN, 1992; GoP/MoE, 2005). It is therefore pertinent to examine the extent to which environmental impacts or sustainability aspects were considered in a development plan or rules being implemented or to be implemented for managing the spatial growth and infrastructure of a city, region or a province (Fischer, 1999). If it is not done, the implementation of such land use planning instruments may lead to unsustainable development pattern. Lahore is the second largest city of Pakistan and provincial capital of Punjab. Whilst its population has crossed 7 million mark, its developed area is touching the boundaries of surrounding cities - Raiwind, Kasur and Sheikhpura. About nine years ago, a new plan titled

'Integrated Master Plan for Lahore- 2021' (IMPL) was prepared (NESPAK/LDA, 2004, See Appendix-A-Figure 2). The Plan's report on existing scenario stated that the city was facing many environmental problems affecting the quality of life of its residents. Some of the problems include: untreated disposal of industrial effluents in water bodies, lack of solid waste management, increasing traffic of motor vehicles and mushroom growth of slum as well as squatter settlements.

The Lahore Development Authority (LDA) has recently initiated midterm review of the said plan. At the same time, City District Government Lahore (CDGL) has entrusted LDA with the task of hiring consultant for the preparation of an "Integrated Strategic Development Plan for Lahore Region 2035 (ISDP-35)". The LDA has prepared its Terms of Reference. Although one of its several goals is to achieve environmental sustainability but the scope of work does not include any SEA or SA (LDA and Urban Unit, 2012). This paper draws attention of decision makers, officers of the LDA and other development planning and management agencies as well as town planning experts towards this important aspect to be incorporated in the review process and in the ISDP. Moreover, no such evaluation of any master plan has been made in Pakistan, to date. The research aims to fill this gap as well.

MATERIALS AND METHODS

Materials and methods for this study include secondary and primary data and analysis of the Master Plan proposals using an evaluation framework. The data were collected firstly through study of the development proposals given in the Integrated Master Plan for Lahore-2021. Secondly, an interview schedule was prepared comprising open ended questions as "open-ended questions tend to be more objective and less leading" (Neuman, 1996). The interviews of concerned officials of LDA, CDGL, Town Municipal Administration (TMAs) of all nine towns and various mater planning experts involved in the preparation of this Plan were conducted to know their viewpoint regarding consideration of environmental impacts in the Plan and suggestions for improvements. The experts working in Lahore were selected using accidental/convenience sampling technique. Mainly, qualitative analysis of the evaluation results/interview data has been done to find out major deficiencies regarding consideration of environmental impacts in the Lahore Master Plan's proposals.

Relevant literature suggests various criteria for evaluating the considerations of environmental /sustainability aspects in a development plan (Gibson, 2006). The evaluation framework used in this paper is

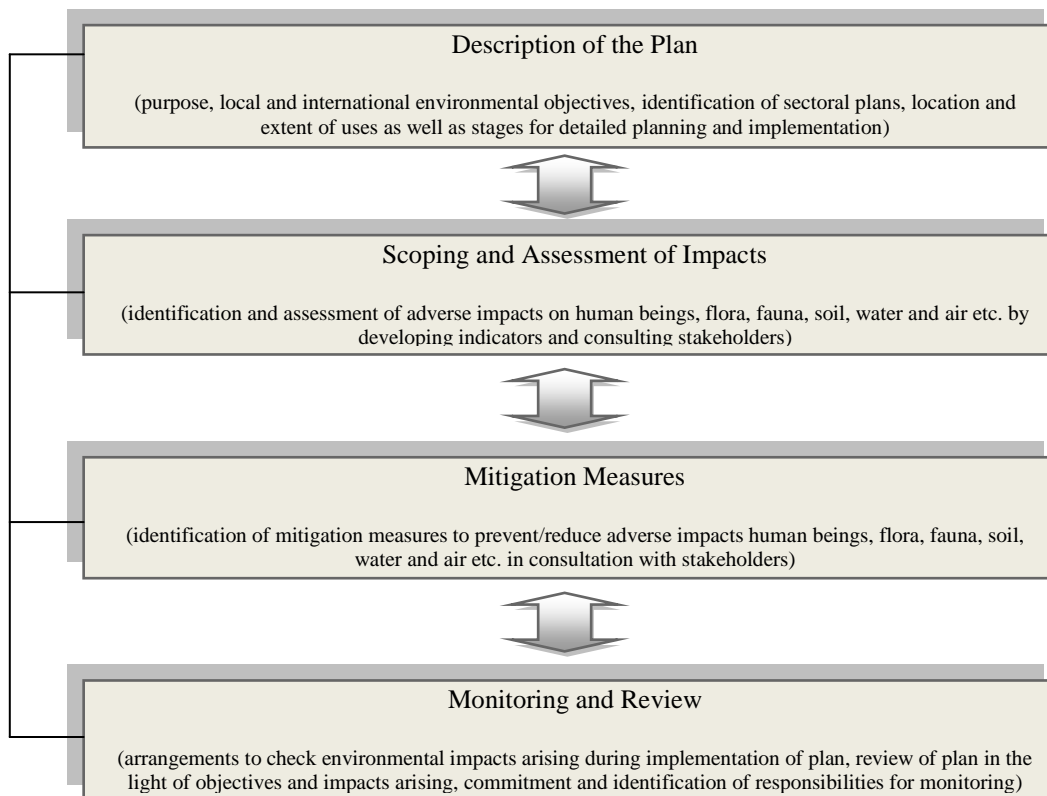


Figure1: Evaluation Framework
Source: Authors own construct

based on the environmental appraisal review package suggested by Lee *et al.* (1999). It has been widely used in UK for this purpose. The set of criteria intend to review the environmental appraisal report included in a plan or prepared separately. It has been modified by the authors, in the light of discussions with experts and availability of data, to include mainly the questions/criteria pertaining to consideration of environmental impacts of development proposals of the IMPL. The evaluation framework has been divided into four sections namely: description of the plan, scoping and assessment of impacts, mitigation measures, and monitoring and review (Figure 1). Description of the plan mainly focuses on the aims and objectives especially relating to environment. Scoping and impacts assessment refer to the systematic process of identifying and assessing possible adverse impacts of the plans proposals, regarding major development sectors like housing, transportation, industry, on the natural environmental receptors and the people. Mitigation measures include possible solutions to minimize environmental impacts. The last set of criteria examines whether effective arrangements were made for monitoring and reviewing the plan's implementation (Chaker *et al.*, 2006).

RESULTS AND DISCUSSION

Description of the Plan: A brief account of the evaluation results has been presented in the Table 1. The Plan has been prepared to establish an integrated framework for the development of Lahore for improving the environment and quality of life. It has been divided into three phases. First and second phases span over five years each while the third phase over ten years. Short, medium and long term projects as well as financial resources for their implementation have been identified. But environmental protection measures have mainly been identified for the short term plan. It is good to note that priority has been given to the improvement of water supply, drainage, sewerage, and solid waste management systems. The location and extent of all land uses like residential, commercial, industrial etc. are discussed in detail in the written document and also shown on a map (Figure 2). Specific objectives of expanding various land uses have not been indicated. However, the national and international environmental objectives have been discussed and a comparison is also made to learn lessons and take mitigation measures to improve the quality of air and water and minimize traffic noise. Generally speaking, this kind of plan is an obsolete idea in developed countries. Strategic plan supported with diagrams is comparatively more flexible to accommodate changing development trends in a sustainable manner (Thornley and Newman, 2011).

Scoping and assessment of impacts: Scoping for the proposals pertaining to the development of housing, transportation and recreational facilities has been done in relevant sections of the plan by just identifying impacts which need to be investigated because of their potentially significant effect on the environment. No technique has been used to assess possible impacts of proposed land uses. Internationally, various techniques are being used for this purpose, for example GIS Modeling, Delphi based change assessment in ecosystem service values, and Land Suitability Index (LSI). The LSI appears to be one of the most useful techniques. It helps evaluating land uses “by combining three main sub-indices concerning (i) the vulnerability of the biosphere, lithosphere, and hydrosphere to impacts arising from implementing development proposals; (ii) the natural heritage value of the target area; and (iii) its contribution to terrestrial ecological connectivity” (Marull *et al.*, 2007; Scolozzi *et al.*, 2012). The Lahore Master Plan does not even suggest how to achieve environmental sustainability in various development sectors.

As far as impact on flora, soil, climate and cultural heritage are concerned, these are neither given due consideration nor the interaction between these environmental receptors is described. The significance of impact on water, landscape and air is given minor consideration. It states that “almost 90% of the industrial units in Lahore are without waste treatment facilities. All kinds of wastes are being disposed-off freely having adverse effects on the environment especially within municipal limits” (NESPAK/LDA, 2004). It is wondering to note that the general public/citizens of Lahore were not consulted during preparation of the plan except a few professionals like Planners, Engineers and Technocrats etc. Nonetheless, most of their suggestions were not given due consideration while scoping and assessing potential impacts of development proposals.

Mitigation Measures: Most of the recommendations made to minimize negative impacts of development are general in nature. However, to avoid adverse impacts of construction activities, the Plan suggests that: “All major construction activities should be carried out with proper environmental considerations and be confined within false boundary walls to protect the environment from dust pollution and other hazards” (NESPAK/LDA, 2004). The Plan further suggests that if it is necessary to remove trees for any development, clearance from the Environment Protection Department (EPD) should be sought and the greenery of Lahore should be protected by all means. Mitigation measures for neutralizing the unpleasant effects of proposed development on climate have not been identified. Relevant literature suggests that SEA is the potential entry point for considering climate change and adaptation in the impact assessment process while considering different scenarios (Agarwala *et al.*, 2010).

Table1. Evaluation Criteria and Summary of the Consideration of Environmental Impacts in the Integrated Master Plan for Lahore-2021.

	Description of the Plan	See Page	Remarks
a.	Are the purpose and lifetime of the plan clearly explained?	P-1	The purpose, lifetime and stages of preparation are clearly stated at the beginning of plan's report.
b.	Are the plan's main policies and proposals, together with their aims, described?	19-18, 19-26, 20-50, 21-8	Sectoral policies and their aims are clearly defined. The ways of implementing the policies are also indicated.
c.	Are the plan's main socio-economic, environmental and/or sustainability objectives clearly stated?		Throughout the plan, there is not a single sector where objectives of development are given and same is the case with socio-economic and environmental sustainability.
d.	Are related land use and sectoral plans identified?	21-1, 23-31, 26-1	Sectoral plans regarding waste management, transport and air quality are discussed in detail.
e.	Are the location and extent of the areas allocated for different types of development indicated in the plan?	Land use map	The plan is supported with the existing and proposed land use maps. The location and extent of all areas are clearly shown to assist in building and development control.
f.	Are the stages/phases for preparation of detailed plans and their implementation framework suggested?	20-8, 21-1, 21-2, 23-16	Future stages are specified in some cases like housing, transportation, flood management and urban environment but not for all sectors.
g.	Are international or national environmental protection objectives considered?	20-2, 22-10	Comparisons of present air pollution levels and water quality are made with international/national standards.
Scoping and Assessment of Impacts			
a.	Are the policies and impacts scoped in a systematic and explicit manner?	20-10, 21-4, 22-16	Policies and their impacts are scoped for some sectors like housing, transportation and recreational facilities. These are totally neglected in the plan.
b.	Are environmental/ sustainability indicators established and justified to assist in impact identification?		
c.	Are the stakeholders consulted to identify possible environmental and socio economic impacts?	P-1, 26-4	General public was not consulted but the professionals like Planners, Engineers and Technocrats etc. were consulted before finalizing the plan.
d.	Are potentially significant impacts on human beings identified, described and their magnitude assessed?	16-3, 19-18, 19-20	Developments which may affect the human beings in negative way are identified and it is suggested that some measures should be adopted to reduce their effects.
e.	Are potentially significant impacts on flora and fauna identified, described and their magnitude assessed?	25-8	In the flood management strategy, potential impacts on fauna are identified but flora is given no consideration.
f.	Are potentially significant impacts on soil identified, described and their magnitude assessed?		Potential impacts on soil are not identified.
g.	Are potentially significant impacts on water quality identified, described and their magnitude assessed?	19-19, 23-36, 23-37	Developments which may adversely affect potable water and water bodies are discussed. An action plan is also proposed for ensuring quality of ground water for drinking.
h.	Are potentially significant impacts on air quality identified, described and their magnitude assessed?		Activities which may pollute air are stated in the plan.
i.	Are potentially significant impacts on climate identified, described and their magnitude assessed?	23-36	No data is available on the impact of development on climate.

(Continued...)

	Mitigation Measures	See Page	Remarks
a.	Are the stakeholders consulted in identifying / proposing mitigation measures?	P1, 26-4, 16-3, 27-7	Community involvement is identified as crucial factor in planning and it is suggested that there should be an open discussion before final decisions are taken.
b.	Are mitigation measures proposed to prevent or reduce significant adverse impacts on the human beings?		Although plan gives general directions to minimize the negative impacts of existing development, yet it does not identify any adverse effect of development proposals on human beings or suggest any mitigation measure to cope with these problems.
c.	Are mitigation measures proposed to prevent or reduce significant adverse impacts on the flora and fauna?	26-3	About the Flora, plan clearly states that the greenery of Lahore must be protected by all means. However Fauna is totally neglected in plan.
d.	Are mitigation measures proposed to prevent, reduce adverse impacts on the soil?		Plan does not take account of any proposal to protect the soil from development proposals which will affect it adversely.
e.	Are mitigation measures proposed to prevent, reduce significant adverse impacts on the water quality?		No inclusion of mitigation measures specific to the plan's proposals. Instead some general measures are included for improving the water quality.
f.	Are mitigation measures proposed to prevent, reduce significant adverse impacts on the air quality?	26-4	Proposals to avoid only the detrimental effects of construction activity are included. It does not specify mitigation measures for the impacts of other development proposals.
g.	Are mitigation measures proposed to prevent, reduce significant adverse impacts on the climate?		No mitigation measures for neutralizing the unpleasant effects of proposed development on climate are suggested in the plan.
h.	Are mitigation measures proposed to prevent, reduce adverse impacts on the landscape?	26-3, 26-6	Plan takes account for avoiding the detrimental impacts of proposed development and also proposes mitigation measures for that.
i.	Are mitigation measures proposed to prevent, reduce significant adverse impacts on the cultural heritage?		No consideration is given to cultural heritage throughout the plan.
j.	Is the anticipated effectiveness of the proposed mitigation measures indicated?		Plan does not assess how far the proposed mitigation measures shall be effective.
k.	Are the commitment to, and responsibilities for, mitigation measures stated?	26-4, 27-4, 27-6	Responsibilities of different departments to mitigate the problems created by different development proposals are clearly narrated.
Monitoring and Review			
a.	Are monitoring arrangements proposed to check the environmental impacts, their conformity with the predictions and implementation of mitigation measures?	26-5	Plan states that all major development suggested likely to effect the environment negatively, should get clearance from EPD and it is the responsibility of EPD to monitor the environmental impacts arising during implementation.
b.	Are there provisions to review the plan on a regular basis to ensure that any unexpected environmental impacts would be identified and taken into account in plan revisions?		No provision of any framework for reviewing the plans for minimizing unexpected environmental effects on regular basis.
c.	Are the commitment to, and responsibilities for, monitoring and review stated?	27-4 27-9	According to the plan, it is the responsibility of LDA to monitor and review the plan implementation.

Source: Authors own construct by adapting evaluation criteria from Lee *et al.* (1999) and reviewing IMPL-2021 (NESPAK/LDA. 2004).

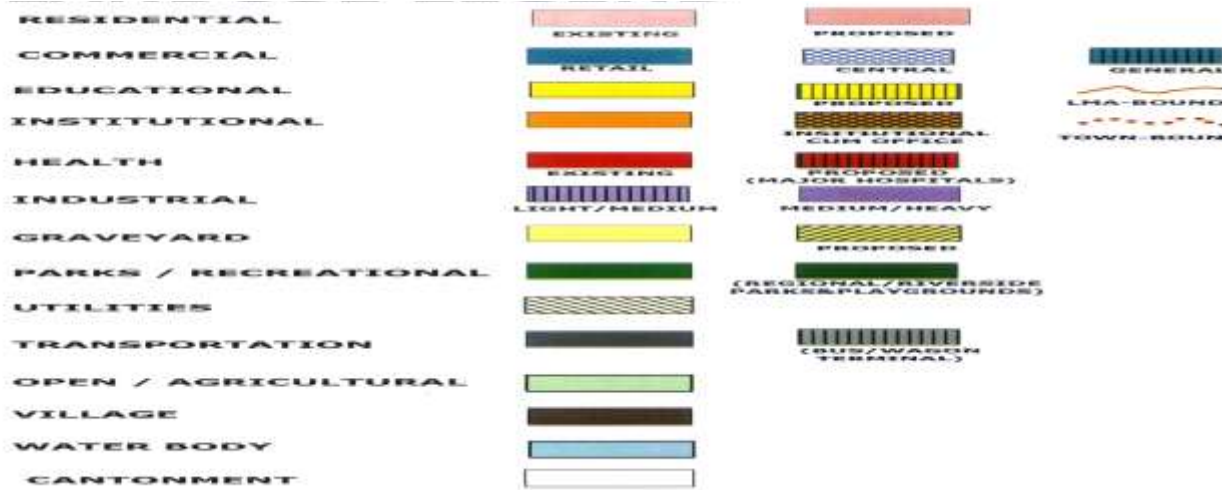
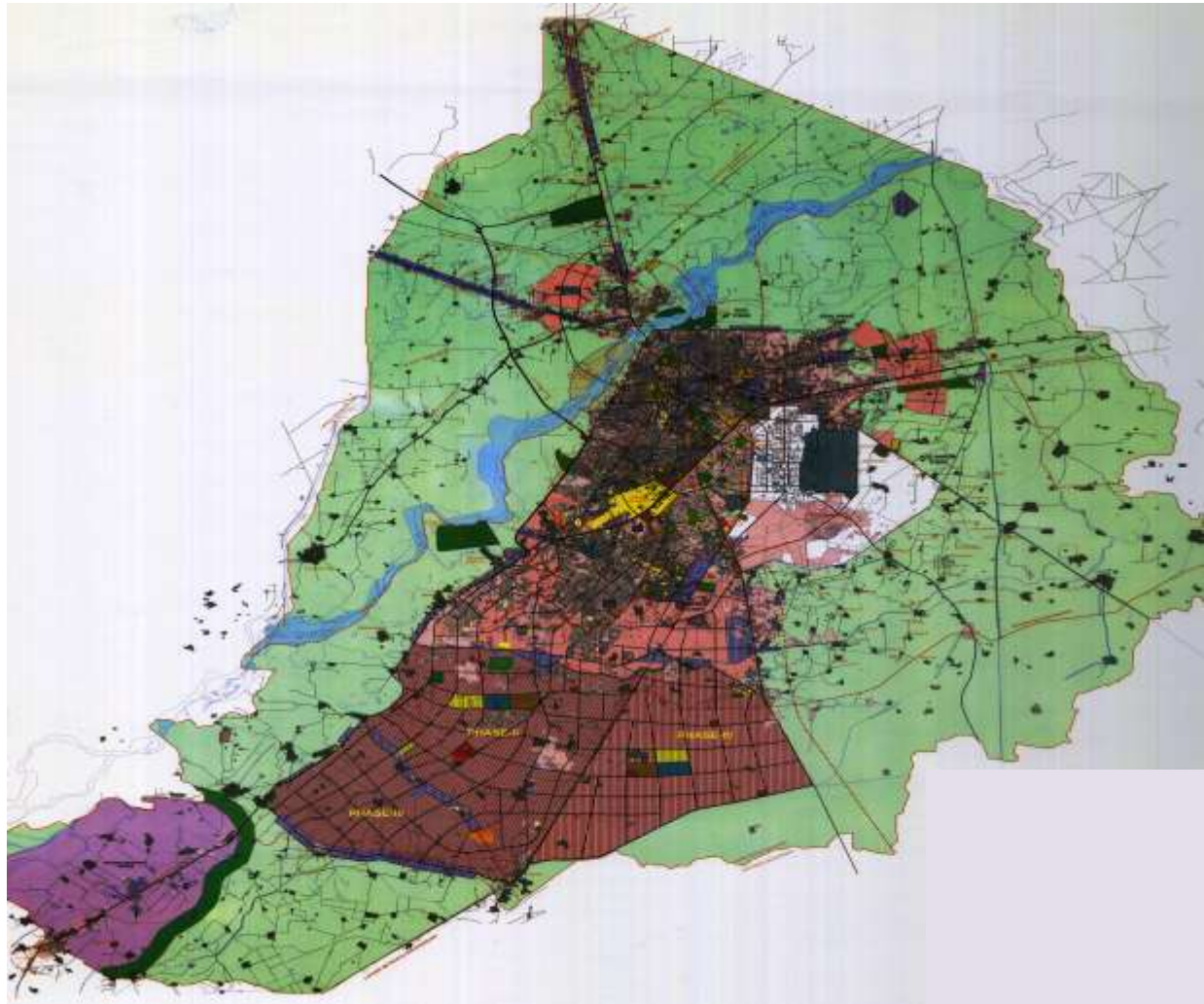


Figure 2: Integrated Master Plan for Lahore (IMPL-2021)
Source: NESPAK/LDA. (2004)

However, SEAs of land use plans in some of the developed countries, for instance, German and England even failed to consider climate change impacts for large scale spatial development (Wolfgang *et al.*, 2012). Whatever mitigation measures have been proposed by the Lahore Master Plan, their effectiveness also depends on the human resources and infrastructure development. In this regard, strengthening of these departments for successful implementation of the Plan has been suggested. It clearly describes responsibilities of government departments and agencies in implementing proposed mitigation measures. Community involvement for the success of efforts related to environmental protection is identified as of critical importance. 'Community Liaison Units/ Cells' are required to be formed by all civic agencies which would work in close contact with the citizens at various stages of policy formulation and implementation of decisions related to environmental protection.

Monitoring and Review: Continuous monitoring and reviewing have been frequently suggested as one of the key performance areas and important ingredient for successful implementation of a plan (Retief, 2007). These are also significant for ensuring environmentally friendly development. Nonetheless, it might be difficult to propose detailed monitoring and review arrangements at early stages in the plan making process. In the Lahore Master Plan, it is suggested that: "LDA needs to develop an "Environmental Management Plan" for all new housing schemes and those recently developed, which should be strictly implemented" (NESPAK/LDA, 2004). A high level commission has been proposed for implementation and review of the Master Plan. It is pertinent to mention here that this 20 member commission consists of only one Town Planner.

Point of view of town planners/ master planning experts: The Town Planners working with NESPAK (consultant of this master plan) claimed that sufficient surveys and studies were conducted along with collection of secondary data to prepare the Master Plan for Lahore. Furthermore, environmental impacts of future development proposals were given due consideration and a separate chapter on urban environment is included in the main report. However, GIS was used only as drafting tool instead of establishing a database. They further suggested that there was a need to strengthen concerned institutions to ensure the implementation of Master Plan. Action Area Plan should also be prepared, as metropolitan city level plan cannot contain much detail.

On the other hand, majority of the Town Planners working with the Master Planning Cell of LDA, Town Officers Planning and Coordination (TOP&C) working with the City District Government Lahore and its Town Municipal Administrations, stated that the surveys conducted to collect basic data for the

preparation of plan were inadequate. The Master Plan was predominantly based on secondary data. The map of existing land uses does not match with ground realities and have so many contradictions. Most of the concerned departments/agencies were not involved in planning process. It resulted in many decisions which are not practically feasible. The industrial development proposals are given only general consideration regarding environmental impacts. Compatibility of land uses is suggested for location of industries within industrial estate. But there is no proposal to explicitly deal with pollutants and maintain the sustainability of the city's environment.

According to officials of Industries Department, the Master Plan envisages a beautiful planning yet environmental considerations were not taken into account while proposing future development. Officials of the Environment Protection Department (EPD) working in the CDGL stated that, the physical scenario was not considered during preparation of master plan. Only paper work was carried out based on secondary data which does not match with the ground reality at various points. Like, Mehmmod Booti is shown as exclusive industrial area but actually it also contains residential units.

Conclusions and Recommendations: The results presented in the previous section lead to the conclusion that consideration of environmental aspects in the Lahore Master Plan is weak. The Plan is deficient in identifying adverse effects of proposed development on wider environment/regional communities. As, none of the globally recognized methods viz. Strategic Environmental Assessment (SEA) or Sustainability Assessment (SA) has been used for assessing the cumulative environmental impacts of development. It mainly includes general discussion on environmental issues and possible adverse impacts and emphasizes to prepare detailed environmental management plan of major development projects. The people of Lahore were deprived of opportunities for meaningful participation at preparatory and proposals making stages of the Plan that affected its quality and reliability. As a result, conditions of economic inequality, social instability, environmental degradation and unsustainable development are emerging in the city. Some of the very many reasons are that capacity for environmental assessment and participatory planning for sustainable development does not exist in the Plan making and implementing organizations.

There is an immense need to build capacity of relevant government agencies to undertake SEA of Master Plans. The evaluation criteria methodology provides a systematic framework to determine the consideration of environmental aspects in a master plan. It may be further augmented by inclusion of criteria for evaluating social and economic sustainability of the plan. There is a need to develop SEA process design for land

use planning which suits the socio-economic and geopolitical contexts of Pakistan. This sort of exercise done during the preparation of master plans can make the development proposals environmental friendly. However, implementation of the plan in its letter and spirit is a prerequisite for promoting sustainable development of cities.

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