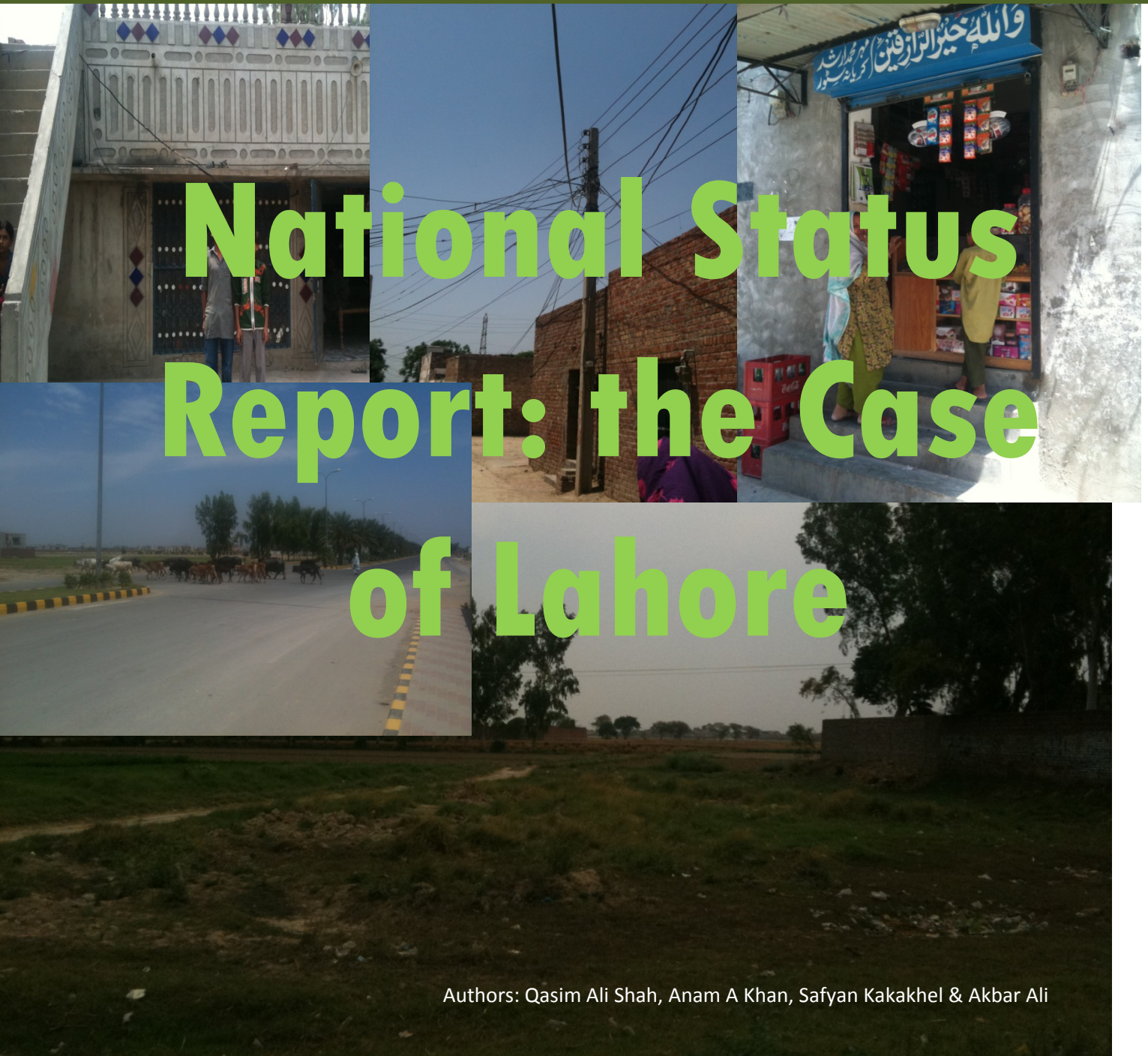


Rural to Urban Transitions and the peri-urban interface: identifying, mapping and understanding peri-urban areas in India and Pakistan

National Status Report: the Case of Lahore



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# Table of Contents

## Contents

<b>Table of Contents</b> .....	<b>1</b>
<b>List of Tables</b> .....	<b>3</b>
<b>List of Figures</b> .....	<b>4</b>
<b>List of Abbreviations</b> .....	<b>5</b>
<b>Introduction</b> .....	<b>6</b>
<b>Executive Summary</b> .....	<b>8</b>
<b>Chapter 1. Definition of peri-urban</b> .....	<b>15</b>
<b>Chapter 2. Lahore and its Urban Expansion</b> .....	<b>20</b>
Introduction.....	20
Pre-partition: Mughal Raj.....	20
British Raj .....	21
Post Partition.....	24
<b>Chapter 3. Health &amp; Environment</b> .....	<b>30</b>
Section I: Overview.....	30
Millennium Development Goals .....	32
Section II: Health .....	35
Health Hazards in Peri-Urban Areas.....	35
Healthcare Facilities Available to Peri-Urban Residents .....	37
Section III: Environment.....	39
Water, sanitation and hygiene.....	39
Solid Waste.....	44
Industrial waste in the Drains of Lahore .....	45
Water Scarcity .....	48
Soil and Agriculture .....	49
Air and Noise .....	54
Climate Change and Global Warming .....	61
Conclusion .....	62
<b>Chapter 4. Governance</b> .....	<b>66</b>

The concept of governance.....	66
The evolution of rural and urban governance structures.....	68
Consequences/impacts of governance structures and policy responses and emerging issues .....	76
Conclusion .....	81
<b>Chapter 5: Conclusion .....</b>	<b>82</b>
<b>Chapter 6: Way Forward &amp; Recommendations .....</b>	<b>84</b>

## List of Tables

Table 1 Population growth of Lahore City .....	26
Table 2 Water Supply and Sewerage Connections in Punjab's Major Cities 2005/06 .....	40
Table 3 Water Supply Characteristics in Pakistan.....	41
Table 4 Groundwater Quality Status in Different Groundwater Monitoring Units of Punjab, 2005 (Area in ha) .....	42
Table 5 Sanitation Facilities in Pakistan (Census, 1998) .....	43
Table 6 Manpower Status of Waste Collection/Transportation and Cleaning.....	45
Table 7 District-level Detail of Industrial and Municipal Discharge in Punjab .....	48
Table 8 Soils Affected by Various Types of Salinity and Sodicity (in million hectares).....	50
Table 9 Area Affected by Water Erosion (in million hectares) .....	51
Table 10 Area Affected by Wind Erosion (in million hectares).....	51
Table 11 Annual Mean Values of Suspended Particulate Matter (PM 2.5) from Jun 2010-May 2011 .....	55
Table 12 Consumption of Coal (000 M/Tons).....	58
Table 13 Motor Vehicles on the Road (000 Nos).....	59
Table 14 Key Environmental Issues .....	<b>Error! Bookmark not defined.</b>
Table 15 Cost of Damage to Environment and Natural Resources .....	<b>Error! Bookmark not defined.</b>
Table 16 Land Use under LDA Master Plan 2021.....	72

## List of Figures

Figure 1 Lahore & Environs from 1893 Showing Civil Station .....	22
Figure 2 Lahore Urban Development (Pre-British to Date) .....	23
Figure 3 Charts showing Historical Growth of Lahore .....	26
Figure 4 Population Projection for Lahore City .....	27
Figure 5 LDA Lahore Metropolitan Area Master Plan 2021 .....	28
Figure 6 Pakistan's progress on health-related Millennium Development Goals .....	33
Figure 8 Pakistan-World disease rate comparison .....	36
Figure 7 Infectious diseases in Pakistan (2006) .....	36
Figure 9 A drain at the back of a peri-urban neighborhood .....	42
Figure 10 Shared sink in peri-urban residence .....	43
Figure 11 Solid waste dumped on an empty plot in the middle of houses (peri-urban area) .....	44
Figure 12 Indus System .....	46
Figure 13 Availability of water resources (per capita) .....	49
Figure 14 Crop Production per unit of Water Available .....	53
Figure 15 Crop Production per unit of Fertilizer Available .....	53
Figure 16 PM 2.5 .....	54
Figure 17 Urban air pollution: Nitrogen Dioxide Concentrations in Pakistan's Main Cities.....	56
Figure 18 Wood used for cooking in peri-urban residence .....	57
Figure 19 2001 LGO Administrative Structure .....	70
Figure 20 Functions of Offices of District Govt. LGO 2001 .....	71
Figure 21: Old and New CBD of Lahore .....	73
Figure 22 Institutional Structure of WASA.....	75
Figure 23 Institutional Structure of LWMC.....	75

## List of Abbreviations

<b>AC</b>	Assistant Commissioner	<b>MVE</b>	Motor Vehicle Examiner
<b>ARI</b>	Acute Respiratory Infection	<b>NEAP</b>	National Environment Action Plan
<b>BHU</b>	Basic Health Unit	<b>NEQS</b>	National Environmental Quality Standards
<b>CBD</b>	Central Business Districts	<b>NGO</b>	Non-Governmental Organization
<b>CDG</b>	City District Government	<b>NRB</b>	National Reconstruction Bureau
<b>CNG</b>	Compressed Natural Gas	<b>NSDWQ</b>	National Standards for Drinking Water Quality
<b>DCO</b>	District Coordination Officer	<b>PCAP</b>	Pakistan Clean Air Program
<b>DHA</b>	Defence Housing Authority	<b>PDSSP</b>	Punjab Devolved Program Social Services Program
<b>DHQ</b>	District Headquarter	<b>PEPA</b>	Pakistan Environment Protection Act
<b>DMG</b>	District Managing Group	<b>PMDGR</b>	Pakistan Millennium Development Goals Report
<b>EAQS</b>	Environment Air Quality Standards	<b>PSLMS</b>	<i>Pakistan Social</i> and Living Standards Measurement Survey
<b>EIA</b>	Environment Impact Assessment	<b>RHC</b>	Rural Health Center
<b>EMRO</b>	Eastern Mediterranean Regional Office	<b>SDPI</b>	Sustainable Development Policy Institute
<b>EPA</b>	Environmental Protection Agency	<b>SHO</b>	Station House Officer
<b>EPD</b>	Environment Protection Department	<b>SPM</b>	Suspended Particulate Matter
<b>FAO</b>	Food & Agriculture Organization	<b>TB</b>	Tuberculosis
<b>FBS</b>	Federal Bureau of Statistics	<b>TEPA</b>	Traffic Engineering & Planning Agency
<b>GHG</b>	Greenhouse Gases	<b>THQ</b>	Tehsil Headquarter
<b>GW</b>	Groundwater	<b>TMA</b>	Tehsil Municipal Administration
<b>IUCN</b>	International Union for the Conservation of Nature	<b>UC</b>	Union Council
<b>JPMA</b>	Journal of Pakistan Medical Association	<b>UDW</b>	Urban Development Wing
<b>KAIRP</b>	Katchi Abadi Improvement and Regularization Program	<b>UNDP</b>	United Nations Development Programme
<b>LDA</b>	Lahore Development Authority	<b>UNFCCC</b>	United Nations framework Convention on Climate Change
<b>LGO</b>	Local Government Ordinance	<b>WASA</b>	Water and Sanitation Agency
<b>LHW</b>	Lady Health Worker	<b>WHO</b>	World Health Organization
<b>LIT</b>	Lahore Improvement Trust	<b>WSS</b>	Water Supply & Sanitation
<b>LMA</b>	Lahore Metropolitan Area		
<b>MCHC</b>	Maternal and Child Health Center		
<b>MDG</b>	Millennium Development Goals		
<b>MTDF</b>	Mid-Term Development Framework		

## Introduction

Urbanization in Pakistan in general and issues related to peri-urban areas in particular have emanated in a complex and turbulent overall socio-political environment, characterized by numerous democratic and military regime changes, a deteriorating security and law & order situation including ethnic and sectarian violence and armed uprisings, a high rate of inflation resulting in a drastic increase in the costs of staple food and other household commodities, rising prices of fuel, and a worsening energy crisis, among others.

Discussions with experts for the purpose of this study revealed that there has been virtually no planning for urbanization carried out in Pakistan in the past, nor have any steps taken in the present effectively materialized yet. Most of the major towns and cities of Pakistan have developed in a random manner without the necessary planning for infrastructural growth expected and required of urban centers. Additionally, migration of people from smaller towns and cities to the larger ones has been spurred on by the lack of adequate educational and health facilities and a lack of sufficient employment opportunities in the smaller cities, thus accelerating the unsystematic and haphazard growth of peri-urban areas and unregulated human settlements in cities like Lahore.

This National Status Report on the peri-urban areas of Lahore draws upon secondary sources, census reports of the government of Pakistan, existing literature and detailed interviews carried out for this study. The research team working on this project also visited various peri-urban areas in Lahore district, Punjab and interviewed some of the residents in the area.

The report comprises six sections, in addition to the Introduction and the Executive Summary. Section 1 reviews some of the existing literature with regards to peri-urbanization, and moves on to describe the definition of 'peri-urban areas', that is, the characteristics identified for classification of the peri-urban concept particularly for purposes of this study.

Section 2 takes a look at the history of the city of Lahore, and the variations, trends and patterns of its demographics, government administration mechanisms and urban expansion over the pre-partition to post-partition eras.

Section 3 gives an overview of the overall health and environment situation in Pakistan and of Lahore city and its peripheries. It takes a look at the sanitation and hygiene conditions and infrastructural and institutional facilities related to waste management, water supply and healthcare; key environmental

issues, cost of damages to environmental and natural resources; land, water, air and noise pollution, soil and agriculture, climate change and global warming among others.

In section 4, the focus is set entirely on governance: it presents a detailed breakdown of the various administrative bodies and mechanisms of governance in place in Lahore and describes the institutional structures of all administrative and municipal bodies present in Lahore city and peri-urban areas. Section 4 also looks at some laws and the various manifestations and perspectives of governance, as well as the governance of the health and environment departments. The conclusion, recommendations and the 'way forward' is presented in the last section with regards to the themes discussed in this report.



## Executive Summary

The official Economic Survey of Pakistan shows that Pakistan is the most urbanized country in South Asia with over 37% of its population living in cities and a 3.1% rate of urbanization per annum. Pakistan is the sixth largest country in the World in terms of population, which has been estimated at around 173.6 million according to the latest World Bank figures, of which around 48% are females. Around two-thirds of the total population has been reported to live in rural areas. More than half of the total population of the country (around 56%) lives in Punjab province. Punjab has 35 districts and the provincial capital Lahore (which also happens to be the second-largest city in the country after Karachi) is a city district having a population exceeding 12 million, of which around 28%, or 3.36 million, are estimated to live in peri-urban areas.<sup>1</sup> In Punjab, the urban poverty rate is stated to be around 26% and the rural poverty rate at around 36%.

Punjab is by far the fastest developing province in the country; in terms of urbanization, almost 40% of the population is living in urban areas. In Lahore district there is hardly any area left that can be pointed out as traditional “rural”; in fact there is the city of Lahore and its fringes. Urbanization means that more people are now living and working in cities and the volume of travel and trade in urban regions has increased; with urbanization comes a new stride of demands for travel, housing and other social services.

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<sup>1</sup> Budlender, D. (2009). “Informal Economy Budget Analysis in Pakistan and Ravi Town, Lahore”, Urban Policies Budget Briefing Note, No. 2, 2.

## **Definition of 'Peri-Urban'**

Researchers, writers, urban planners, governments and other academicians have viewed peri-urbanization through various angles so there is no agreed unique definition for the context of "peri-urban" as yet. Some scholars have worked to define the term 'peri-urban' as 'a place, concept or process'; referring to the urban fringe and the geographic edge of cities as a place, the movement of goods and services between physical spaces, an interface between rural and urban activities, institutions and perspectives as a concept and the transition from rural to urban contexts as a process.<sup>2</sup>

The characteristics identified for classification of the peri-urban concept particularly for purposes of this study include: size of population, population density, access to infrastructure, time and cost of accessing larger urban areas, type of houses, land use, availability of education, availability of health facilities, sources of water supply, source of income (employment pattern), source of finance in development and tenure regularity and permanency.

## **Lahore and its Urban Expansion**

Due to unavailability of land towards other directions, Lahore city has expanded towards the south and south-west mostly through private housing schemes. The peri-urbanization in Lahore thus has taken place due to in-migration from neighboring towns, as well as out-migration from the City center. Also, the distribution of various land uses, land values, densities and socio-economic characteristics has not been uniform in the City. Most of the rural in-migrants required low-income residences giving rise to slums and squatters due to weak regulation.

By year 2001, i.e. during first 50 years of creation of Pakistan, Lahore has physically grown rather sprawled along major corridors from the area of 68 sq km to 397 sq km. This development is not only for housing the in-migrants, but also for development of industrial estates, small scale enterprises, universities, professional colleges and vocational institutes. The peripheral growth continues haphazardly along Ferozpur Road, Shahadra, Bund Road and River Ravi. Some large scale private sector development projects include Bahria Town, DHA future phases, Lake City and establishment of new university campuses along Raiwind Road and Kala Shah Kaku Lahore Motoway Bypass are also about to complete. Today, the total area of Lahore District is 2,306 sq. km with a population of approximately 9

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<sup>2</sup> (Narain and Nischal 2007: 261)

million people which is expected to grow to 13 million in 2012. 77% of the population currently is urban and the annual urban growth rate is 3%. Lahore has 150 union councils out of which 122 are urban and 28 are rural.

## **Health & Environment**

Industrial processes, tanneries, pulp and paper plants, mining and some agricultural activities in many developing countries are the most common sources of toxic effluents discharge and hazardous liquid waste directly into soil, air and water, causing contamination which is detrimental to human health, particularly affecting residents of rural and peri-urban areas where cleaner infrastructural facilities and alternatives are limited. The areas of most concern as identified by the Government of Pakistan include water, energy, pollution and waste management, irrigated agriculture and biodiversity.

The health sector of Pakistan in general has been described as "beset with numerous problems: structural fragmentation, gender insensitivity, resource scarcity, inefficiency and lack of functional specificity and accessibility". Pakistan is characterized by a high population growth rate and high incidence of low birth weight babies and maternal mortality. Besides the severe burden of parasitic, contagious and infectious diseases, there is a continuing potential threat from malaria and tuberculosis. In addition to these, other major challenges faced by the health system include inadequate budgetary spending, accessibility (which includes both availability and affordability), and unawareness. These problems are both consequence of, and further aggravated by, serious institutional and governance deficiencies in the system. Acute Respiratory Infections (ARI) are the most common disease type in the country making up a total of 51% of the total national infectious disease burden while malaria and diarrhea follow by making up 16% and 15% respectively. Dysentery and scabies are fourth and fifth most common at 8% and 7% of the total infectious diseases.

Viral Hepatitis, particularly type B and C, are also major epidemics in Pakistan with around 12 million individuals infected. Diseases like diarrhea, gastroenteritis, malaria and jaundice were stated as the most commonly occurring diseases year-round especially during summers and cases of influenza and throat and chest infections were mostly reported during winters. In addition, a large number of skin and other allergies are also very commonly reported in peri-urban areas. Health experts stated that a significant number of the diseases were caused by the use of unsafe, polluted or contaminated water sources in cooking, drinking, washing and/or bathing. Gastroenteritis, diarrhea, jaundice and typhoid

are the most common diseases among children, while in adults there are fewer cases of diarrhea but a large number of cases of gastroenteritis and jaundice.

Access to sanitation facilities in Pakistan is also problematic. Not as much as 50% of the population has access to toilets with 20% of households sharing toilets. In Punjab only one out of four households has access to adequate sanitation facilities. In cases where the households have access to toilets infrastructure lacks resulting in untreated waste converting rivers and streams into sewers. The major industries contributing heavily to environmental degradation include: chemicals, pesticides, textiles, pharmaceuticals, cement, electrical and electronic equipment, glass and ceramics, pulp and paperboard, leather tanning, food processing, and petroleum refining. The National Profile on Chemical Management asserts that chemical industries throw out their effluents in nearby drains or other outlets without any prior treatment.

Moreover, aquifers seem to be unable to match the increasing demand. The withdrawal limits of freshwater sources have finite limits; unfortunately Pakistan has already touched upon these limits of its surface and groundwater sources. It was recorded that the per capita availability of water has decreased to 1100 cubic meters ( $m^3$ ) per person per year in 2007 from 5300  $m^3$  in 1951. With the increase in population and extensive use of water the country is soon to become water stressed; meaning per capita water availability will fall to less than 1000  $m^3$  per person per year.

Studies show that in Pakistan 60% of natural grazing area holds production levels one third lower than its actual biological potential. The country's water supply is mainly dependent on the Indus River system. Over 90% of the food and fiber and most of fodder production come from irrigated agriculture. Environmental implications on crop yields such as water-logging and salinity result from poorly managed irrigation. After the monsoon season 25-30% of the irrigated canals are seen to be water-logged while over 8% of the nation's land endures severe salinity. Moreover, irrigation causes 1.7 tons of salt deposits per hectare every year. The Economic Survey also notes 11 million hectares of arable land is affected by water logging and 3 million hectares of the country are affected by salinity and sodicity. The total soil affected by salinity and sodicity in Pakistan is 6.281 million hectares, out of this 2.667 million hectares lie in the Punjab province. That is over 40% of the total land affected by soil salinity and sodicity in the country is that of Punjab.

Air in Pakistan is shown to contain excessive amounts of suspended particulate matter (SPM). Strong concentrations of SPM can cause numerous health impacts including respiratory diseases and heart ailments. The sources of this hazardous matter include vehicles industry, burning of solid waste, brick kilns and natural dust. Urbanization causes disturbance of soil giving rise to dust clouds; construction roads or the dust blown from motor vehicles driven on unpaved land. Pakistan Environmental Protection Agency (Pak-EPA) has conducted many studies on air, water and noise: a research was carried out on the quality of air in five capital cities of Pakistan including Lahore. It was found that the level of particulate matter size below 2.5 micron (PM) was 4.7 times higher than the safe limit described by National Environmental Quality Standards (NEQS). To evaluate sulfur dioxide levels on international environment air quality standards (EAQS) Punjab Urban Unit measured the level in Lahore (at Lohari Gate): Lahore's  $SO_2$  concentration is 2.1 times higher than the Japanese standard and 1.8 times higher than WHO guidelines. Furthermore, another common phenomenon is the creation of sulphates and photochemical smog. The concentration of nitrogen oxides in the city is ten times higher than that set out standards by WHO: standard set by WHO is 106 ppb while level recorded in Lahore was 328 ppb.

In 2008, Green House Gases (GHG) reached 309 million tons (mt) of Carbon dioxide ( $CO_2$ ) containing 54%  $CO_2$ , 36% Methane, 9% Nitrous Oxide and 1% other gases. The main culprit of these emissions is the energy sector with over 50% contribution. Pakistan contributes only 0.8% of GHG emissions globally; even though the country's per capita energy consumption and  $CO_2$  emissions are low yet in  $CO_2$  emissions per unit of GDP production are relatively high. Rising living standards in the country along with excessively high growth rate of population will increase demand for energy dramatically. Already facing an energy crisis Pakistan will have to use its thermal and coal potentials increasing its GHG emission levels consequently. Also, since Pakistan has low forest cover coupled with high rate of deforestation (0.2-0.4% per annum) carbon sinks will degrade rapidly. In addition global warming also seems to have a visible impact on the survival, growth rate and health of forests. Fast urbanization in Lahore has led to chopping of trees further enhancing air pollution, increasing dust particles and adding to the rise in temperature.

## **Governance**

Governance in peri-urban areas is a complex undertaking because these areas often share the territories of more than one unit. Part of it might be in the rural district and the other part may belong

to the city jurisdiction; such an example exists in the case of Lahore where the population of Ferozwala precinct spreads into both the jurisdiction of the Lahore City District Government and Shiekhupura District. Another reason is that there are limited municipal service providers with sectors such as transport, water, energy, waste management and land use planning. Again, in the case of Lahore, it was revealed to the SDPI team by the Lahore Development Authority (LDA) officials that Water and Sanitation Agency (WASA) a division of LDA has the mandate to cover all of Lahore but only covers around 10 percent of water facilities in the district while the rest of the areas especially peri-urban areas rely on private arrangements of water supply and sanitation. Because of low capacity of the municipalities in these areas, what happens is that peri-urban areas 'fall through the crack' of these fragmented mechanisms of governance.

There are three guiding principles when it comes to governance in peri-urban areas.

1. Thinking and acting strategically, which means that there has to be a balance between long term and short term policies. Rapid urbanization is not a loss-loss situation for peri-urban areas; these come with opportunities as well, such as new employment openings. Urban employment pays much higher than rural employment. It also means more land for low cost housing societies and better infrastructure.
2. A participatory process needs to be established as there is a myriad of actors in urban areas and peri-urban areas at present are 'institutional orphans'.
3. Working incrementally has to be the third guiding principle as no change is going to come overnight.

Peri-urban governance in Pakistan as seen through the case study of Lahore is a relatively new concept. It was only in 2009, when the word peri-urban made its way into the government policies. However, the Govt. of Punjab is committed to drawing up well-structured plans for its urban cities. But as we have seen, governance mechanisms and instructional framework lack expertise and technical capacity to carry out the plans to the letter. Since Local Government is now a provincial subject after the passage of the 18<sup>th</sup> Amendment, the possibilities for every province to devise their own formula of governance has increased which means that a strong political resolute to create an effective system for governance in peri-urban areas will go a long way in achieving the desired effects of urbanization across the province.

## **Conclusion and Way Forward**

In light of the findings of the research, a number of recommendations can be drawn to improve the overall environmental, health, governance, basic service delivery and water & sanitation conditions of peri-urban areas:

- Ensuring adequate land policies and official control procedures are in place to de-necessitate formal land or housing tenure for access to basic services and infrastructure development
- Decentralized approach to basic service provision involving greater user involvement and non-governmental, community-based and private organizations
- Enhanced understanding of the impact of both spatial and non-spatial policies on peri-urban areas
- Wider integrated water management interventions and decentralized wastewater management techniques adapting to and benefitting from unique problems and opportunities
- Need for project planners to not operate unilaterally, but instead encourage the involvement of all relevant entities like legal specialists, urban planners, social scientists, financial analysts, and a wide range of institutions, such as the water and power development authority, the Ministry of Health, water and sanitation authority and urban development authorities.

Intensive educational initiatives for both occupational activities as well as health education, waste disposal, sanitation and hygiene practices, and awareness-raising on other important issues.

## Chapter 1. Definition of peri-urban

Researchers, writers, urban planners, governments and other academicians have viewed peri-urbanization through various angles so there is no agreed unique definition for the context of “peri-urban” as yet. Some scholars have worked to define the term ‘peri-urban’ as ‘a place, concept or process’; referring to the urban fringe and the geographic edge of cities as a place, the movement of goods and services between physical spaces, an interface between rural and urban activities, institutions and perspectives as a concept and the transition from rural to urban contexts as a process.<sup>3</sup>

Iaquinta and Drescher further argue that the definition of peri-urban is interpreted as consequences: “consequently the concept of peri-urban has become trivialized and tautological, its analytical and practical utility severely compromised”.<sup>4</sup> On the other hand, Mortimore and Wilson focus on land-use patterns, accessibility to central city, diversification of household incomes, proximity of markets, availability of farm labor and possibility of off-farm employment, while defining peri-urban.<sup>5</sup>

While some authors concentrate on the proximity to central city and/or highways, industrial existence, commercialization, urban association, changing patterns of agricultural practices along with presence of rural values and traditions<sup>6</sup> others tend to define peri-urban by features such as high and increasing population density, resource exploitation, small landholdings, rice country-side homes, poor slums, assorted incomes, economic dynamism, lack of regulation, contested land tenure rights, unorganized conversion of land use, pollution, environmental issues and lack of service provision.<sup>7</sup> The common understanding of peri-urban is place-based; described as ‘midway between urban centers and rural spaces’<sup>8</sup> and also as ‘lying between cities and counties’.<sup>9</sup>

Research carried out for the USAID Water Sanitation & Health project, while acknowledging the lack of common consensus for a single definition amongst practitioners and researchers, describes peri-urban

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<sup>3</sup> (Narain and Nischal 2007: 261)

<sup>4</sup> Iaquinta and Drescher 2000: 2

<sup>5</sup> Mortimore and Wilson 1965

<sup>6</sup> Halkatti et al 2003

<sup>7</sup> Friedberg 2001; Simon et al 2003; Briggs 1991

<sup>8</sup> Dupont 2005

<sup>9</sup> Cadène 2005



areas as areas that are marginal to the regulatory and physical boundaries of the formal city: these areas have developed largely outside of government control and mostly do not follow traditional or strictly formal urban planning and development processes.<sup>10</sup> Definitive characteristics of peri-urban areas are mentioned as areas with illegal or uncertain land tenures, underdeveloped or non-existent infrastructure, low incomes and lack of recognition by formal governments. It further describes these areas as not having been zoned for housing by the government nor urbanized with infrastructure, with the settlements mostly starting as illegal land invasions that are, therefore, disconnected from the municipal service networks. Municipal authorities do not have the resources or legal binding to cater to the needs of these illegal or informal settlements and are usually overwhelmed by their sheer numbers and needs.

Focusing on sanitation challenges of peri-urban areas, the report cites a number of sanitation challenges unique to these areas: extremely poor infrastructural arrangements for sanitation and demand driven sanitation interventions; political motives coming into play when it comes to improving sanitation conditions in these areas; a conflict of interest and goals between aid organizations who want to improve the sanitation conditions for the people living in these areas, and municipal authorities who do not want such improvements to take place such as to not further formalize these illegal land settlements; lack of data about these areas; cheap land and need for expensive infrastructure; and limited technologies applicable to peri-urban areas.<sup>11</sup>

Some scholars have conversely applied the flows-based approach to the concept of peri-urban referring to peri-urban as 'space', 'zone' or 'interface': taking into account the flows of produce, finance, labor and services in combination with the influence of processes of rapid economic, sociological, institutional and environmental change.<sup>12</sup> When talking about peri-urban spaces it is essential to view the transformations in peri-urban areas as a basic feature. Other studies hold broadly that urbanization can be viewed as a characteristic of the population and can be defined by the land uses and covers along with socio-economic process and interactions of the population and land (McIntyre et al 2000).<sup>13</sup>

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<sup>10</sup>Hogrewe, W., Joyce, S. D. & Perez, E. A. "The Unique Challenges of Improving Peri-Urban Sanitation". WASH Technical Report No. 86, 1993: p. 9

<sup>11</sup> Hogrewe, W., Joyce, S. D. & Perez, E. A. "The Unique Challenges of Improving Peri-Urban Sanitation". WASH Technical Report No. 86, 1993: pp. 10-19

<sup>12</sup> Halkatti et al 2003: 149

<sup>13</sup> Ibid

Tacoli (2003) gives a useful clarification to the concept of peri-urbanization. Globalization is advocating and promoting a decentralized spread in economic activity outward; from largest cities to medium and small cities populations, livelihoods and opportunities are growing in ex-rural areas and now defined as “peri-urban” areas. The peri-urban area is an area where local and food systems are seen to be transforming; the changing rural settlement holds a mix of urban and rural characteristics.<sup>14</sup>

When it comes to official government recognition it is found that in the context of “un-serviced” or “under-serviced” settlements the Government of Pakistan identifies only “katchi abadis” and slums. Katchi abadis are informal settlements on private or state land which are at times notified for which then the Government has Katchi Abadi Improvement and Regularization Program (KAIRP). Slums, on the other hand, are informal settlements on agricultural land with tenure security; no program has been defined at present to develop or normalize these settlements.<sup>15</sup> The term “peri-urban” has recently made an entry in government planning: the term is referred first to in the Punjab Land Use Rules 2008<sup>16</sup> and consequently in the Lahore Development Authority Land Use Rules 2009.<sup>17</sup> In these documents “peri-urban area” is defined as “an area that spans the landscape between contiguous urban development and rural countryside with low population density and is predominantly being used for agricultural activity and is likely to be urbanized in the next twenty years”. This definition and scope of the concept is however limited and the time limit of twenty years seem to be rather long witnessing the rapid urbanization in the country.

The interconnected and interrelated characteristics of peri-urban areas further produce complexities in the understanding of social, economic and environmental systems. Researchers also seem to link peri-urbanization to broader political and economic processes: colonialism, wars, political systems, conflict, liberalization and globalization. Particular themes included in analysis of most scholars (also the focus of this study) are: lack of regulation, environmental issues and human health concerns. The reasons for the

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<sup>14</sup> On the edge of sustainability: perspectives on peri-urban dynamics, Fiona Marshall, Linda Waldman, Hayley MacGregor, Lyla Mehta and Pritpal Randhawa. Economic and Social Research Council. 2009

<sup>15</sup> Urban Slums Reports: **The case of Karachi, Pakistan**, by *Arif Hasan and Masooma Mohib*. UNDERSTANDING SLUMS: Case Studies for the Global Report on Human Settlements 2003

<sup>16</sup> Available online on: <https://docs.google.com/viewer?a=v&q=cache:qdMlopRdxijQ:www.tmachichawatni.com/Download-files/Landuse%2520Rules2008.pdf+&hl=en&gl=pk&pid=bl&srcid=ADGEEsgrD8Fa62A9i92vkWyKFHYCaleW9KLho4y2q4xzIqqXWWkyjNg196KAKrDi4iLYNBs4DMsuTWamSs6nB1oHnIxXoMYPI28C9OaNYEz3K53L0yknRweVJ4EZphoxSnAlyrvTy8Ib&sig=AHIEtbRjUYekYSDQfE1x2haHOpoEIFofSQ>

<sup>17</sup>[http://www.lda.gop.pk/files/lda\\_comnewp.htm](http://www.lda.gop.pk/files/lda_comnewp.htm)

absence of governance or lack of regulation vary over literature but it can be derived that rural and urban authorities' collaboration is yet to be seen.<sup>18</sup>

Scholars have rightly pointed out that ongoing urbanization is resulting in not only an increase in construction on ecologically sensitive areas and diminishing open space but also changing agricultural patterns and straining natural resources. Furthermore, the industrial effluence, air pollution, buildup of solid waste and inadequate provision of basic facilities will stretch and intensify hygienic and sanitation issues (Burte and Krishnankutty 2006; Simon et al 2003; Dahiya 2003; Agrawal et al 2003).<sup>19</sup>

Allen et al (2006) emphasize the importance of peri-urban areas due to their intrinsic nature as an interface between the urban, metropolitan areas and the rural areas and the subsequent social, economic, environmental and institutional interactions between the urban and the rural regions captured in this interface. Out of these processes of change in flows from urban to rural arise both problems and opportunities for sustainable development for not only peri-urban areas, but also the adjacent rural and urban areas.<sup>20</sup>

The well-being and livelihoods of millions of residents of peri-urban areas and home-based cottage industries located in those areas is seriously disadvantaged by the lack of basic infrastructural and water and sanitation services: the amount of time used in collecting water, purchasing it from private vendors or in fighting off illnesses brought about by the use of contaminated water and the almost non-existent sanitation; yet national and international initiatives to enhance the access to improved water and sanitation services tend to ignore the peri-urban context. In terms of governance and service delivery, Allen et al (2006) describe the rather complex and difficult position of peri-urban areas, which are commonly governed by a range of spatial and non-spatial policies and a number of different municipal and other agencies operating with "*overlapping and sometimes contradictory remits*". For example, while some government policies might try to restrict the expansion of peri-urban areas, others might try to encourage the relocation of particular businesses or industries to peri-urban areas thus indirectly leading to their growth and expansion. Governance of peri-urban areas, similarly, is severely

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<sup>18</sup> On the edge of sustainability: perspectives on peri-urban dynamics, Fiona Marshall, Linda Waldman, Hayley MacGregor, Lyla Mehta and Pritpal Randhawa. Economic and Social Research Council. 2009

<sup>19</sup> On the edge of sustainability: perspectives on peri-urban dynamics, Fiona Marshall, Linda Waldman, Hayley MacGregor, Lyla Mehta and Pritpal Randhawa. Economic and Social Research Council. 2009

<sup>20</sup> Allen, A, Dávila, J D and Hofmann, P, "Governance of Water and Sanitation Services for the Peri-urban Poor: A Framework for Understanding and Action in Metropolitan Regions", Development Planning Unit, UCL, London 2006, p. 13

fragmented with numerous actors and no single public or private organization providing leadership or guidance.

Hafeez et al (2009) define peri-urban areas as “*immediately adjoining an urban area; between the suburbs and countryside*”.<sup>21</sup> Their study is based on an analysis of the milk production systems in peri-urban areas of Lahore; particularly the market structure, sources, productivity and hygiene issues. Smallholder producers such as *gawala* (milk-producing) colonies and peri-urban dairy farms form a significant part of the income and employment in peri-urban areas, and the provision of proper training and educational facilities would largely benefit the residents of these areas economically whilst reducing health risks to end-users.

The characteristics identified for classification of the peri-urban concept particularly for purposes of this study include: size of population, population density, access to infrastructure, time and cost of accessing larger urban areas, type of houses, land use, availability of education, availability of health facilities, sources of water supply, source of income (employment pattern), source of finance in development and tenure regularity and permanency. These characteristics not only pertain to the definitive traits of peri-urban areas agreed upon most commonly by practitioners and scholars, but are also well suited for the case of Lahore in the current national and situational context. Stakeholders spoken to agreed to this set of chosen indicators as relevant and important to define peri-urban areas. Moreover when the SDPI research team travelled to Lahore and visited many surroundings of the main urban city of Lahore; these visited reconfirmed the relevance of the indicators chosen.

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<sup>21</sup> Hafeez et al., “Analysis of milk production systems in peri-urban areas of Lahore (Pakistan)”, Pakistan Economic and Social Review Volume 47, No. 2 (Winter 2009), pp. 229-242

## Chapter 2. Lahore and its Urban Expansion

### INTRODUCTION

Lahore's history dates back to over a millennium where the oldest record on the City can be found in historical memoirs. The exact date or period of foundation of Lahore is not known to historians, but estimated to be founded during the first century A.D. Lahore was founded by Loh-son of Rama, and the current name is a variation from the original word "Lohawar" meaning "Fort of the Loh." Lahore is situated on the left bank of River Ravi and is bounded on the north and west by Sheikhpura District, on South by Kasur District and on East by International border with India.

Urban expansion of Lahore has taken place over hundreds of years travelling through various regimes; where most of the urban development initiatives took place during the British and Post Partition period. This expansion further increased during fifties and sixties with newly initiated Lahore Improvement Trust that did not only cause expansion of the city's footprint, but also reshuffled and redistributed land uses and socio-economic characteristics. However, the growth of Lahore has been haphazard and unplanned.

### PRE-PARTITION: MUGHAL RAJ

During the earlier regimes of Hindu, Afghans, Turk and Mughal Rulers, the physical form of Lahore underwent various changes though confined within and around the walled City of Lahore. Prior to Mughal era Lahore was confined to the area west of Shah Alami Bazar and north of Bhatti Gate within the old walled city. Mughal Emperor Akbar established a grain market expanding the city in the easternmost arc which is still used for the purpose today. Like the emperor himself court nobles were encouraged to build palaces, gardens and religious institutions leading to rapid expansion of Lahore in terms of urban extent and population. This trend continued during the reign of Shah Jahan and the City grew with construction of Shalimar gardens and many mansions of local landlords.<sup>22</sup>

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<sup>22</sup> Glover, William J. 2008. *Making Lahore Modern: Constructing and Imagining a Colonial City*. University of Minnesota Press [ ISBN-10: 0816650225 | ISBN-13: 978-0816650224]

During the period of Aurangzeb Alamgir the population in the walled city used to be at its peak only when the emperor and his court used to reside. Otherwise, the suburbs had become more populous than the walled city itself. The suburban expansion during the late Mughal Empire added about six times that of the walled City area into the City of Lahore. With the exception of the Imperial Palace, most of the urban development took place in an ad-hoc manner. These suburban developments/settlements were named after founders, holy personages, or auspicious natural features of the area for instance Jowhari bazaar named after its founding jewelers, Mohallah Pir Aziz (now Mozang) after the name of buried Pir, and Mohallah Sed Sar near Mian Mir after the water tank whose water was believed to heal skin diseases.<sup>23 24</sup>

## **BRITISH RAJ**

After the death of Ranjit Singh when the Sikh rule weakened in Punjab the British Army entered Lahore in 1846, established the Council of Regency and became the real central authority of the city. During this time, the Lahore Cantonment was established with wide roads, parks and well laid out residential and unit areas.

During the year 1863-64, the Municipal Committee was formed which undertook initiatives for improvements of urban services in the city of Lahore, which provided strong impetus towards urbanization.<sup>25</sup> In addition to the development works, regulatory and service provision mechanism was also developed during British period through formulation of new Municipal Act in 1911, a Lahore Electric Supply Company in 1912 and establishment of Lahore Improvement Trust (LIT).

The new range of institutions restructured urban life in Lahore, spreading in a several square miles of the Civil Station as shown in Figure 1. Till 1901, when the literacy rate among the city's 200,000 residents was less than 5 percent there were 5 liberal art colleges, 3 professional colleges, 28 secondary schools, 112 primary schools and several religious institutions. Establishment of the largest manufacturing facilities for spinning and weaving cotton employed over 770 workers, whereas the North-Western Railway workshops, iron foundries, mechanized oil and flour mills and scores of printing

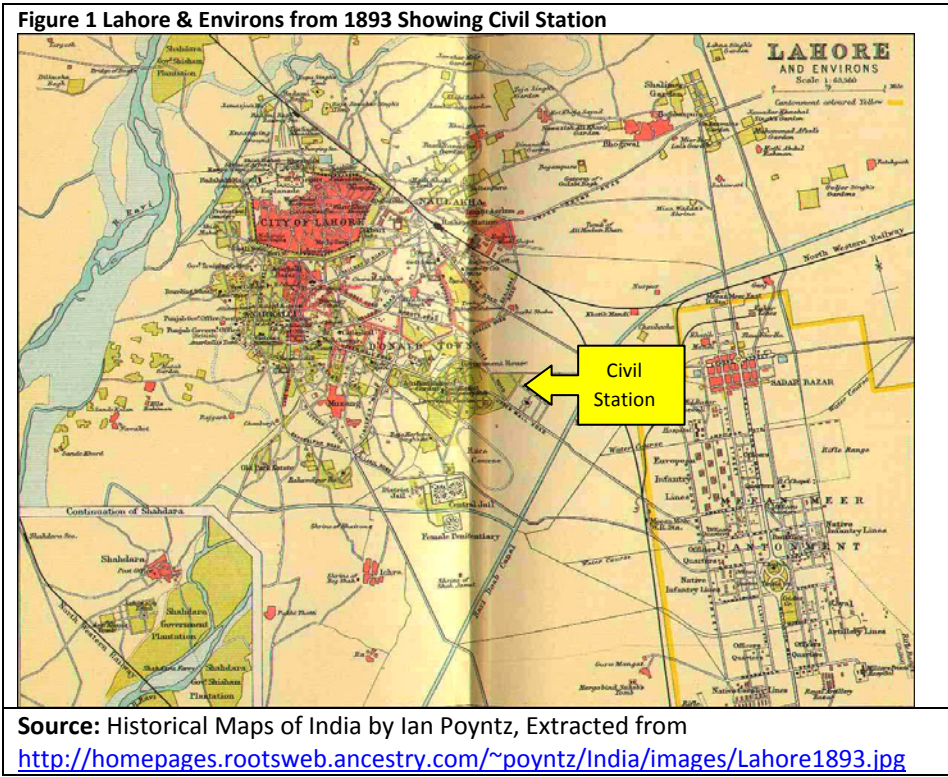
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<sup>23</sup> Glover, William J. 2008. *Making Lahore Modern: Constructing and Imagining a Colonial City*. University of Minnesota Press [ ISBN-10: 0816650225 | ISBN-13: 978-0816650224]

<sup>24</sup> Latif, Sayed M. *Lahore: Its History, Architectural Remains and Antiquities*

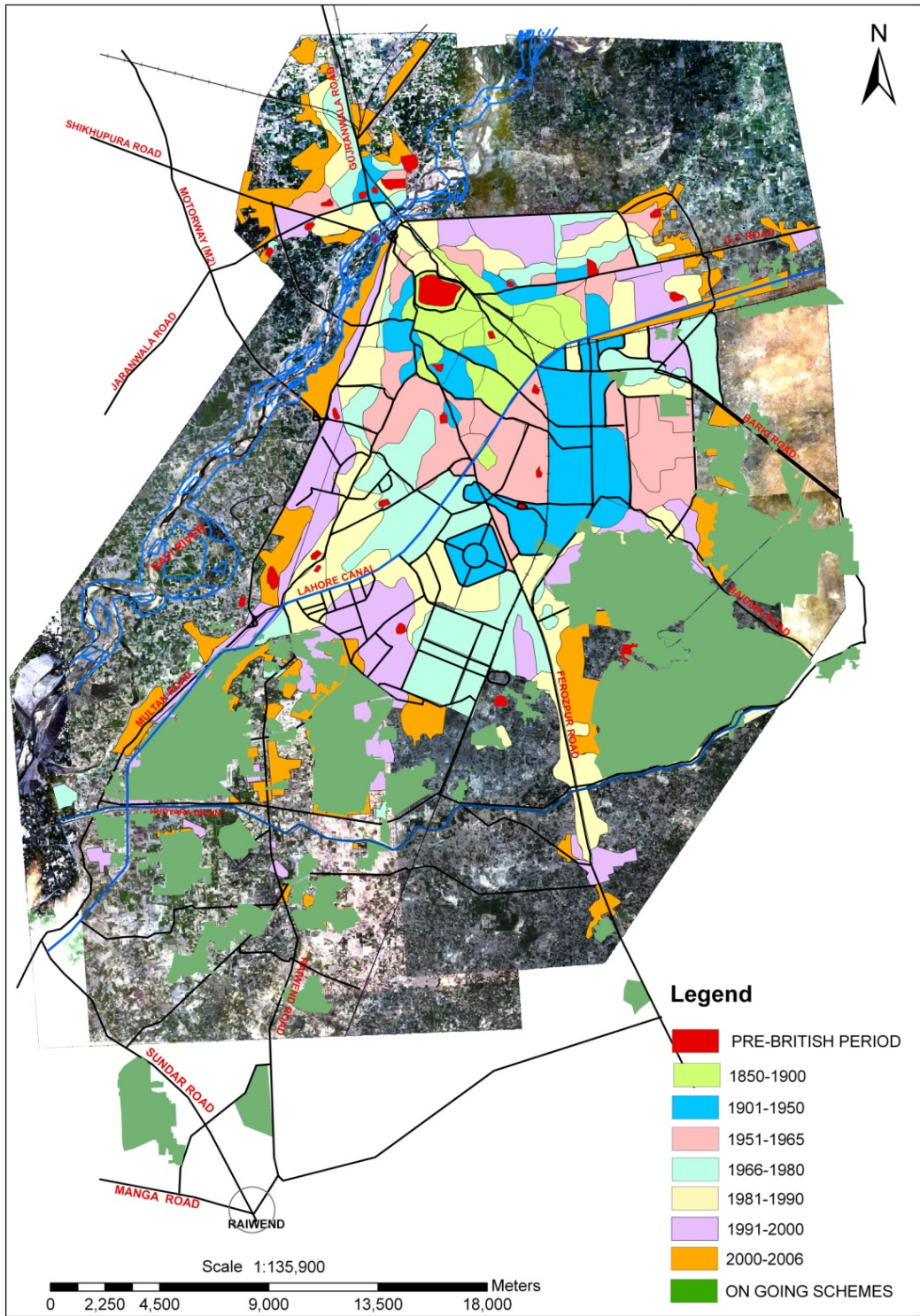
<sup>25</sup> Ibid Pg 290

presses in the city employed over 4500 employees. By that time due to aforementioned developments and services, a cable tram used to transfer passengers from the Railway Station to the “Charring Cross,” an intersection in the center of a new commercial district along the Mall Road this led to the perception of Lahore as being a “metropolis” by its residents. Lahore during British period became urbanized beyond the Walled City in fact it sprawled towards South and South East as shown in Figure 2.<sup>26</sup>



<sup>26</sup> Glover, William J. 2008. *Making Lahore Modern: Constructing and Imagining a Colonial City*. University of Minnesota Press [ISBN-10: 0816650225 | ISBN-13: 978-0816650224]

Figure 2 Lahore Urban Development (Pre-British to Date)



Source: The Urban Unit, GoPb, 2008. Developing a Comprehensive City Boundary for Lahore by NESPAK



## POST PARTITION

In 1941 the status of Municipal Committee of Lahore was raised to the status of Municipal Corporation; extending its jurisdictional limits. In 1947, with partition of British India into Pakistan and India, about 40% of the City's population migrated in and out of the City, causing major upheaval in socio-economic and physical setup of Lahore, also damaging many buildings.

As per the Integrated Master Plan of Lahore 2021, reconstruction of the Walled City was entrusted to the Lahore Improvement Trust (LIT) under the Punjab Development of Damaged Areas Act 1952. During fifties and sixties, the LIT initiated both new and redevelopment projects such as Shah Alami, Gulberg, Samanabad, Upper Mall Schemes etc. as well as numerous housing exercises, industrial areas, new university campuses, airport and other planning exercises, which have sprawled within the two decades to almost two folds of built up area towards South and South-West.<sup>27</sup> In addition to the aforementioned factors of low density and low cost of land and construction, considerable residential development in the peri-urban areas occurred due to increased car ownership during fifties and sixties. In addition to residences, industries and shopping centers began establishing in the peri-urban areas especially along Ferozpur Road and Multan Road, whereas offices began moving to the City center further increasing densities and land values within the center. Thus, the expansion in the peri-urban areas did not only increase the city's footprint, but also reshuffled and redistributed land uses and socio-economic characteristics.<sup>28</sup>

The peri-urbanization in Lahore thus has taken place due to in-migration from neighboring towns, as well as out-migration from the City center. Also, the distribution of various land uses, land values, densities and socio-economic characteristics has not been uniform in the City. At some places, distribution has occurred to segregate a land use from the others or vice versa. Due to weak governance and regulation of the peri-urban areas, the pockets and gaps between planned developments have either been encroached or occupied for some unwanted or inappropriate land use.<sup>29</sup>

The rural in-migrants led residential development in peri-urban areas along Ferozpur Road and Multan Road due to availability of housing areas like Ichhra, Mozang and Model Town in close vicinity.

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<sup>27</sup> CDG Lahore, 2004. *Integrated Master Plan of Lahore 2021* by NESPAK & The Urban Unit, GoPb, 2008. *Developing a Comprehensive City Boundary for Lahore* by NESPAK

<sup>28</sup> Gulzar, Farhat. *The Urban Fringe of Lahore City – A Functional City*, University of the Punjab, Lahore 1976, (Thesis for the Degree of Doctor of Philosophy in Urban Geography)

<sup>29</sup> *ibid*

Moreover, new housing colonies like GOR II & III, Shadman, Fazalia Colony, Rehmanpura, Wahdat Colony, Gulberg, and Kot Lakhpat Township filled in the vacant areas between the Ichhra, Mozang and Model Town.<sup>30</sup>

Most of the rural in-migrants required low-income residences giving rise to slums and squatters due to weak regulation. The huge backlog of low income housing could not be addressed even by the interventions of LIT or House Building Finance Corporation. The housing projects of LIT only provided 43% of the housing units to middle and low middle income groups, and 7% to lower income groups. Another challenge for lower income groups remained that of financing, which could not be taken by the House Building Finance Corporation for housing units out of the LIT's schemes.<sup>31</sup>

During 1975, due to regional importance of Lahore amongst the neighboring districts, the Government of the Punjab vide Housing & Physical Planning Department's notification dated May 19, 1975 declared the jurisdiction of Lahore Metropolitan Area (LMA) including most parts of Lahore Districts, part of Kasur District and Ferozewala Tehsil of Sheikhpura District covering about 2306 sqkm (including 250.61 sqkm Ex-MCL, 92.67 sq km Lahore Cantonment Board). This jurisdiction was added with additional area from South of Lahore in 1988 by the Director General Lahore Development Authority.

By 1998, Lahore was transformed into a metropolis with a population of about 6.32 million<sup>32</sup> and a developed area of about 300 sq km and by 2001 with an estimated population of 7.71 million. By year 2001, i.e. during first 50 years of creation of Pakistan, Lahore had physically grown rather sprawled along major corridors from the area of 68 sq km to 397 sq km. This development is not only for housing the in-migrants, but also for development of industrial estates, small scale enterprises, universities, professional colleges and vocational institutes. Historical development of Lahore for first 50 years after independence is illustrated from Figure 3 below.<sup>33</sup>

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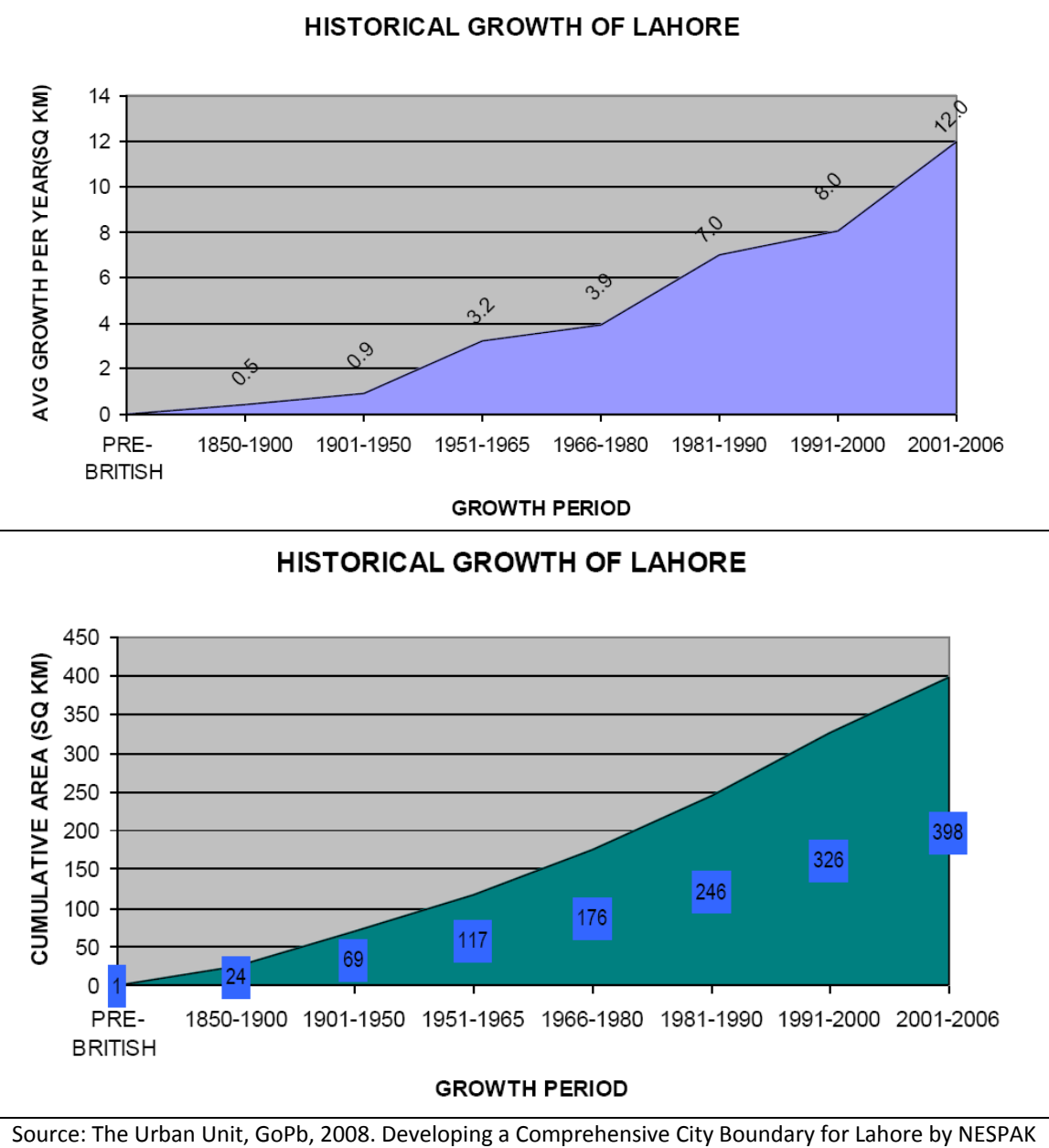
<sup>30</sup> ibid

<sup>31</sup> ibid

<sup>32</sup> Government of the Punjab. 2011. *Punjab Development Statistics 2011*

<sup>33</sup> The Urban Unit, GoPb, 2008. *Developing a Comprehensive City Boundary for Lahore by NESPAK*

Figure 3 Charts showing Historical Growth of Lahore



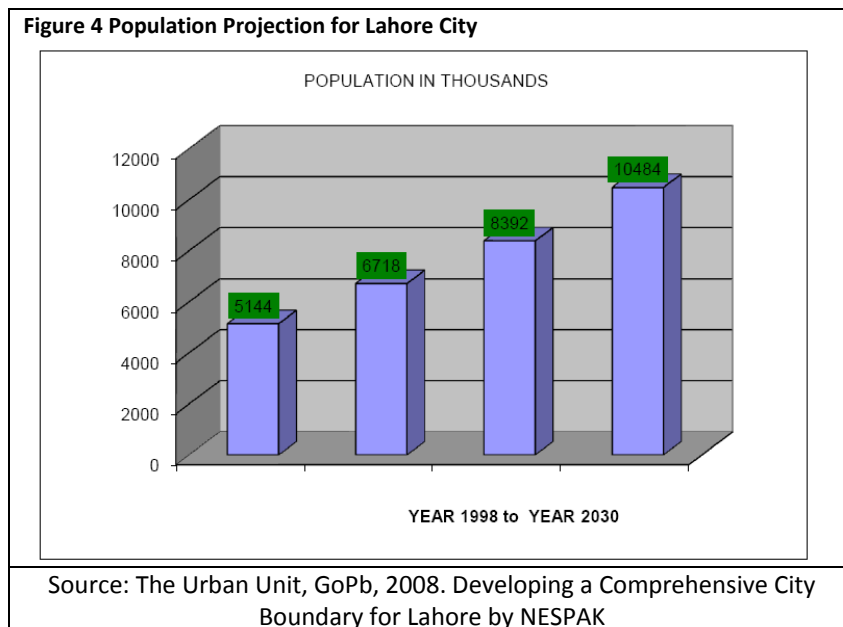
Population growth of Lahore City as per Census 1998, with estimated population for 2020 and 2030 is given in Table 1 and Figure 4.

Table 1 Population growth of Lahore City

YEAR	POPULATION
1901	203,000
1911	229,000
1921	282,000
1931	430,000
1941	672,000

1951	849,000
1961	1,296,000
1972	2,170,000
1981	2,952,000
1998	5,209,088
2011 (Estimated)	7,432,838
2020 (Estimated)	10,095,014
2030 (Estimated)	14,185,076

2004. Integrated Master Plan of Lahore 2021 by NESPAK & The Urban Unit, GoPb, 2008. Developing a Comprehensive City Boundary for Lahore by NESPAK & Punjab Development Statistics. (Population Estimates by Urban Unit)

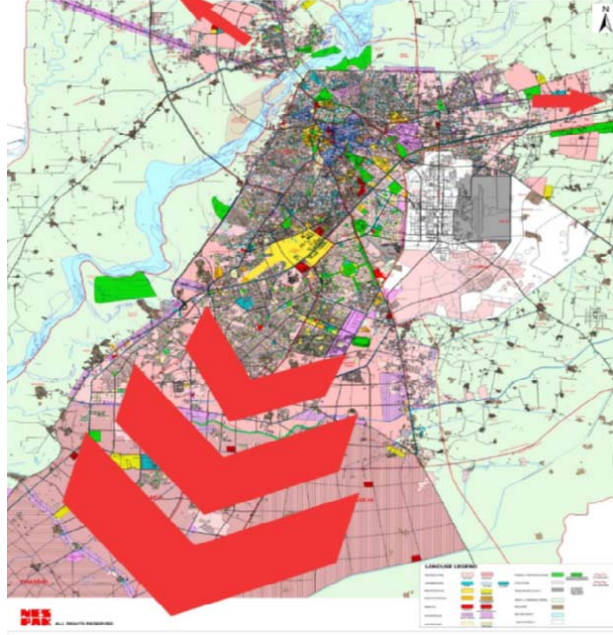


From the year 2000 to date, development has further occurred along major corridors and towards South and South-West side. Due to advancement in technology, the built up area along with newly planned schemes are overlaid onto satellite imagery to view the urban extent. The approximate area as shown in green color in Figure 5, about 566 sq km of Lahore has been urbanized.

The peripheral growth continues haphazardly along Ferozpur Road, Shahadra, Bund Road and River Ravi. Some Large scale private sector development projects include Bahria Town, DHA future phases, Lake City and establishment of new university campuses along Raiwind Road and Kala Shah Kaku Lahore Motoway Bypass are also about to complete. Today, the total area of Lahore District is 2,306 sq. km with a population of approximately 9 million people which is expected to grow to 13 million in 2012.

77% of the population currently is urban and the annual urban growth rate is 3%<sup>34</sup>. Lahore has 150 union councils out of which 122 are urban and 28 are rural.<sup>35</sup>

Figure 5 LDA Lahore Metropolitan Area Master Plan 2021



The growth of Lahore city is affected by certain characteristics. Ravi River towards the north and northwest coupled with the likelihood of inundation of its plain during the flood season acts as a natural boundary to the expansion of Lahore city in that direction. Expansion towards the eastern side is limited because of the proximity of border with India. Another limitation to the city's growth is the presence of restricted areas as delineated by the Armed Forces which include all the area located within 1143 meters of an arms depot at Thokar Niaz Baig and area under the Fortress Defence Policy. Furthermore, main highways which pass through the city including G.T. Road, Multan Road, Sheikhpura Road and Ferozepur Road disrupt the urban sprawl as they require a separate road grade. This principle also applies to all the railway tracks that pass through the city. Furthermore, most of the land within the jurisdiction of Lahore Municipal Authority is privately owned and is now being developed into private housing schemes. This development requires Lahore Development Authority to provide city-level services in areas where the population density is relatively lower as compared to the urban centers and

<sup>34</sup> Chief Metropolitan Planner, LDA. Khan, Waseem A. "Lahore Peri-Urbanization." Personal interview. 30 Apr. 2012.

<sup>35</sup> NESPAK. *Lahore City Boundary*. Rep. Lahore: Urban Unit, P & D Dept, 2009. Print.

to be able to provide these services, LDA also has to acquire land at market rates which is a strain on its already limited budget thus causing further problems in expanding the regulatory boundaries<sup>36</sup>.

Operating under the above mentioned circumstances, Lahore has experienced growth within the parameters discussed ahead. The first of these parameters is densification, which is most prominent in the city centers. Low income groups lack the resources to procure land in these areas so building activities are concentrated through practices such as 'sub division of existing plots, in-filling of empty plots and addition of stories'. But this can only continue up to a point where the basic services will be too congested to support future growth after which it will have to be taken elsewhere.

However, the growth of Lahore along the city borders has been haphazard and unplanned and such a pattern is observed most readily in Harbanspura, areas South of Khairee Distributary along both the sides of Ferozepur Road, Shahdara Road, River bed across the Bund Road, areas along the G.T. Road north of Ferozwala.<sup>37</sup> Due to unavailability of land towards other directions, Lahore city has expanded towards the south and south-west mostly through private housing schemes. But this development of land is mostly residential which means an increase in overall number of commuters to work. This surge has led to an increase in the already burdened roads which requires a comprehensive investment in the trunk infrastructure. If business, trade and commercial centers are moved to these newly developed centers, it will not only prevent the extra burden on road infrastructure but also prevent un-planned 'ribbon development' along these roads which Punjab had already witnessed along the G.T. Road since the 1960s as discussed earlier.

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<sup>36</sup> Ibid.

<sup>37</sup> Urban Planner, Urban Unit. Naqvi, Syeda S.Z. "Lahore Peri-Urbanization." Personal interview. 30 Apr. 2012.

## Chapter 3. Health & Environment

This chapter has been divided into three parts: the first part begins with an overview and gives a quick glance at where Pakistan lies in its progress towards the Millennium Development Goals (MDGs). In the second part, we will discuss the health hazards being faced by the residents of peri-urban areas of Lahore, the health facilities available to this population and how they tackle health challenges. Further issues of water, sanitation and hygiene are discussed in the third part including subjects of: residential waste, solid waste, industrial effluents, drinking water situation, sanitation facilities, water scarcity and resource depletion. The section also touches upon health hazards to the residents of peri-urban areas due to water and sanitation problems along with the damage to soil and agriculture. Briefly the status of air and noise pollution is also discussed in the chapter closing with how the situation is being worsened by challenges of climate change.

### SECTION I: OVERVIEW

It has been predicted that most of the World's population growth over the next 30 years will occur in urban areas of poor countries.<sup>38</sup> Additionally, explosive, unplanned and unsustainable growth and expansion of urban zones are causing developing cities to face the greatest threat from emerging environmental and health hazards. Urbanization brings with it both benefits and pressures; major impacts on peri-urban regions include new structures of households, change in land use, access to "urban" infrastructure such as health facilities, change in employment pattern and an increased strain on natural resources. Peri-urban areas offer new opportunities but with increased poverty and environmental degradation.<sup>39</sup> This supports the view to see "peri-urban" as an area of complementariness; at the nexus of various opportunities and exclusions interdependence exists between natural resources, agriculture and urban processes in peri-urban spaces.<sup>40</sup>

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<sup>38</sup> Montgomery, M, et al, eds. "Cities transformed: demographic change and its implications in the developing world." London, Earthscan, 2004.

<sup>39</sup> UNFPA 2007

<sup>40</sup> Dupont 2005; also see Rohilla 2005

Peri-urban areas around the world especially those in developing countries are characterized by their poor sanitation and hygiene conditions and a severe lack of infrastructural and institutional facilities related to waste management, water supply and healthcare at both the community and household levels. Reportedly, a considerable proportion of overall environment related health issues can be linked to a few key risk areas, including poor quality, availability and sanitation of water; vector-borne diseases; poor outdoor and indoor air quality; and toxic substance contamination.<sup>41</sup>

The unfortunate but true fact is that poor and marginalized are most susceptible; this is the class that faces challenges of pollution and congestion. The peri-urban areas are by definition in fact the residential areas for low-income individuals; these households have no capacity to protect themselves from effects of pollution; they not only don't have the capacity to deal with troubles of environment but they don't have resources to invest in protection of the environment and/or protection from the environment.<sup>42</sup>

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<sup>41</sup> Smith, K, Corvalán, C & Kjellstrom, T. "How much global ill health is attributable to environmental factors?" *Epidemiology* 1999; 10 (5): 573-84.

<sup>42</sup> Pakistan Urban Sector Strategy Study. June2000. Government of Pakistan



## **MILLENNIUM DEVELOPMENT GOALS**

The Millennium Development Goals (MDGs) are a set of eight goals whose primary objective is to aid nations around the world improve living standards of their people to prescribed minimum acceptable levels by the year 2015. Along with many other countries of the World, Pakistan also pledged its full dedication to the achievement of these goals at the Millennium Summit in New York in 2000. The primary targets of the MDGs are ending extreme poverty and hunger, gender equality, improving health conditions and the provision of universal education. A study of Pakistan's progress on the health-related MDGs, namely: Goal 4 – 'reduce child mortality', Goal 5 – 'improve maternal health' and Goal 6 – 'combat HIV/AIDS, malaria and other diseases', provides a fairly good understanding of the condition of health in the country.

The Pakistan Millennium Development Goals Report (PMDGR) 2010, prepared by the Government of Pakistan Planning Commission's 'Centre for Poverty Reduction and Social Policy Development', provides a detailed breakdown of the progress made on each Goal. Figure 6 summarizes Pakistan's progress on the health-related goals against the respective prescribed indicators used to measure them. From this figure it can be seen that Pakistan's progress on the 'reduction of child mortality' goal is satisfactory on three of the total six indicators, namely proportion of less than one-year old children immunized against measles, Lady Health Workers coverage of target population and proportion of children under five who suffered from diarrhea in the past 30 days and received ORT. The progress on the three primary indicators for this goal; controlling the under-five mortality rate, the infant mortality rate, and proportion of fully immunized children, is off-track or lagging.

**Figure 6 Pakistan’s progress on health-related Millennium Development Goals**

<b>4. Reduce Child Mortality</b>	
Under-five mortality rate	Lag
Infant mortality rate	OffTrack
Proportion of fully immunized children 12-23 months	Lag
Proportion of under 1 year children immunized against measles	On Track
Proportion of children under five who suffered from diarrhoea in the last 30 days and received ORT	Ahead
Lady Health Workers' coverage of target population	On Track
<b>5. Improve Maternal health</b>	
Maternal mortality ratio	Lag
Proportion of births attended by skilled birth attendants	Lag
Contraceptive prevalence rate	Lag
Total fertility rate	Lag
Proportion of women 15-49 years who had given birth during last 3 years and made at least one antenatal care consultation	Lag
<b>6. Combat HIV/AIDS, Malaria and other diseases</b>	
HIV prevalence among 15-24 year old pregnant women (%)	Ahead
HIV prevalence among vulnerable group (e.g., active sexual workers) (%)	Ahead
Proportion of population in malaria risk area using effective malaria prevention and treatment measures	Lag
Incidence of tuberculosis per 100,000 population	Lag
Proportion of TB cases detected and cured under DOTS (Direct Observed Treatment Short Course)	Ahead
<b>7. Ensure Environmental Sustainability</b>	
Forest cover including state owned and private forest and farmlands	Lag
Land area protected for the conservation of wildlife	On Track
GDP (at constant factor cost) per unit of energy use as a proxy for energy efficiency	Slow
No. of vehicles using CNG	Ahead
Sulphur content in high speed diesel (as a proxy for ambient air quality)	Lag
Proportion of population (urban and rural ) with sustainable access to a safe improved water source	Lag
Proportion of population (urban and rural) with access to sanitation	Lag
Proportion of Katchi Abadis regularized	-

Source: Pakistan Millennium Development Goals Report 2010, Planning Commission, Government of Pakistan

The status of Goal 5, ‘improve maternal health’, is lagging on all of the six indicators used to measure its progress. While the situation is satisfactory on indicators related to measure HIV prevalence in Goal 6, ‘combating HIV, malaria and other diseases’, the progress on indicators related to proportion of population in malaria-risk areas using malaria prevention and preventive measures is lagging, as is progress on the incidence of tuberculosis per 100,000 population.

On the goal related to environmental sustainability (goal 7), Pakistan lags behind on forest cover, sulphur content in high speed diesel and proportion of population (both rural and urban) with a sustainable and safe access to drinking water and sanitation. No data is available for the indicator related to the regularization of slums and informal settlements (katchi abadis). The only indicator that seems to be ahead, of what the initial target was, is the use of CNG in vehicles but it is true that the

excessive use of CNG has caused a shortage of natural gas causing load shedding of over fifteen hours a day in even the posh areas of the country; the poor residential areas have only been bestowed with empty gas pipelines from the beginning of this winter, many have reverted to coals or wood for cooking purposes.

## SECTION II: HEALTH

### HEALTH HAZARDS IN PERI-URBAN AREAS

Pakistan's Federal Ministry of Health, which was the ministry primarily responsible for all health-related issues in the country, was abolished on 30<sup>th</sup> June 2011 and the responsibility of the health sector was subsequently devolved to the provinces under the widely criticized Devolution Plan of the 18<sup>th</sup> Constitutional Amendment. The WHO had expressed their apprehension about this devolution in a letter written to the Prime Minister of Pakistan by the WHO regional director for the Eastern Mediterranean, Dr. Hussein A. Gezairy. The primary concern of WHO was that provinces did not have the required infrastructure, necessary resources or enough medical staff, and that the handing over of the responsibility of health sector to provinces in these circumstances could "wreak havoc".<sup>43</sup>

The health sector of Pakistan in general has been described as "*...beset with numerous problems: structural fragmentation, gender insensitivity, resource scarcity, inefficiency and lack of functional specificity and accessibility*" by a paper published in the Journal of Pakistan Medical Association (JPMA).<sup>44</sup> Furthermore, the WHO reports that Pakistan falls short on most social development indicators when compared with countries of similar per capita income: the health status in Pakistan is characterized by a high population growth rate and high incidence of low birth weight babies and high maternal mortality. Besides the severe burden of parasitic, contagious and infectious diseases, there is a continuing potential threat from malaria and tuberculosis. In addition to these, other major challenges faced by the health system include inadequate budgetary spending, accessibility (which includes both availability and affordability), and unawareness. These problems are both consequence of, and further aggravated by, serious institutional and governance deficiencies in the system.<sup>45</sup>

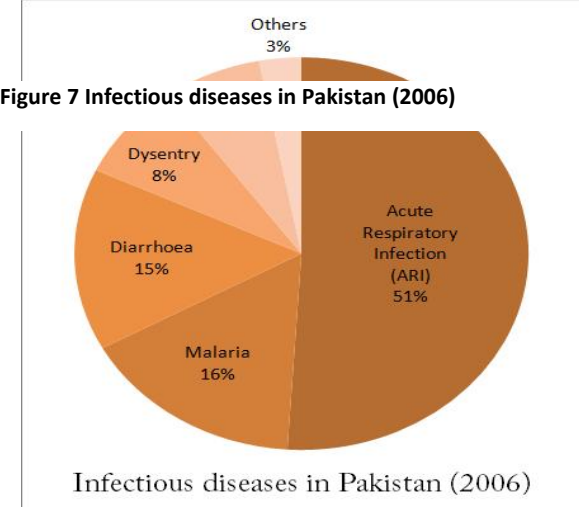
*Acute Respiratory Infections* (ARI) are shown as the most common disease type in the country making up a total of 51% of the total national infectious disease burden while *malaria* and *diarrhea* follow by making up 16% and 15% respectively evident from Figure 7. Dysentery and scabies are fourth and fifth

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<sup>43</sup> Taj, A. (2011). "WHO apprehensive about Health Ministry's devolution". Pakistan Today. Available Online at <http://www.pakistantoday.com.pk/2011/06/18/news/national/who-apprehensive-about-health-ministry%E2%80%99s-devolution/>

<sup>44</sup> A. Islam (2002). "Health Sector Reform in Pakistan: Future Directions". Journal of Pakistan Medical Association.

<sup>45</sup> WHO (2007). "Health Systems Profile- Pakistan". Regional Health Systems Observatory- EMRO.



most common at 8% and 7% of the total infectious diseases. Viral Hepatitis, particularly type B and C, are also major epidemics in Pakistan with around 12 million individuals infected.

Figure 8 shows the country comparison of various diseases occurring in Pakistan with those of the lowest and the highest incidence countries in the World.

**Figure 8 Pakistan-World disease rate comparison**

Source: Ministry of Health (2007)

Disease group	World's lowest country rate	Country rate	World's highest country rate
Diarrhoea	0.2	13	107
Respiratory infections	0.1	9	71
Malaria	0.0	0.2	34
Other vector-borne diseases	0.0	0.3	4.9
Lung cancer	0.0	0.2	2.6
Other cancers	0.3	1.0	4.1
Neuropsychiatric disorders	1.4	2.2	3.0
Cardiovascular disease	1.4	3.2	14
COPD	0.0	1.8	4.6
Asthma	0.3	1.2	2.8
Musculoskeletal diseases	0.5	0.6	1.5
Road traffic injuries	0.3	1.6	15
Other unintentional injuries	0.6	6.2	30
Intentional injuries	0.0	0.9	7.5

Source: World Health Organization. "Pakistan: Country profile of Environmental Burden of Disease".

In meetings with doctors located in the peri-urban areas of Lahore, the commonly occurring health issues identified were described as seasonal in nature, i.e. there were clearly visible patterns of the prevalence of different types of diseases in the hot summer season and those occurring in winters. Diseases like diarrhea, gastroenteritis, malaria and jaundice were stated as the most commonly occurring diseases year-round especially during summers and cases of influenza and throat and chest infections were mostly reported during winters. In addition, a large number of skin and other allergies are also very commonly reported in peri-urban areas. Health experts stated that a significant number of

the diseases were caused by the use of unsafe, polluted or contaminated water sources in cooking, drinking or bathing, etc.

According to the Urban Unit in Lahore, gastroenteritis, diarrhea, jaundice and typhoid are the most common diseases among children living in peri-urban areas of Lahore, while in adults there are fewer cases of diarrhea but a large number of cases of gastroenteritis and jaundice.<sup>46</sup>

### **HEALTHCARE FACILITIES AVAILABLE TO PERI-URBAN RESIDENTS**

According to information provided by health experts, the residents of peri-urban areas usually avail the services offered by Basic Health Units (BHUs) for common illnesses while patients are brought to the major public hospitals in Lahore for treatment in case the condition of the patient is more serious. The BHU's, however, were described by community members of the peri-urban areas as being poorly equipped, lacking basic medical items and often suffering from the absence of relevant medical staff. It was observed in visits to the peri-urban areas, and also mentioned by health experts during discussions, that a large number of the residents of peri-urban areas will often visit informal 'medical dispensaries', outlets meant for only the sale of over-the-counter and prescription drugs, where the 'pharmacist' with usually no formal degree or certification provides medical services like check-ups, diagnosis and prescription of medication for the more common illnesses like diarrhea, fever, flu and cough, etc.

Public health delivery system that is administrated at district level operates as an integrated health complex. Provision of healthcare is one of the responsibilities of the state; it provides a range of public health interventions as well as healthcare through a three-tiered healthcare delivery system. The core of the primary healthcare structure includes Basic Health Units (BHUs) and Rural Health Centers (RHCs). On the other hand, secondary care which includes first and second referral facilities offering ambulatory, acute, and in-patient care is provided through Tehsil Headquarter Hospitals (THQs) and District Headquarter Hospitals (DHQs), both of whom are supported by tertiary care from teaching hospitals. Integrated health system also consists of Maternal and Child Health Centers (MCHCs) although the number of MCHC remains limited. Basic obstetric care with community outreach programs is provided through Lady Health Workers (LHWs) via these MCHCs, BHUs and RHCs.

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<sup>46</sup> Hussainy, A.S. (2007). "Relationship between Community Health Behavior, Water & Sanitation Facilities in a peri Urban Area of Lahore, Pakistan". Urban Unit, Planning and Development Department, Lahore, Government of Punjab, Pakistan

Technically, there is a vast network of healthcare facilities in Pakistan, which includes 919 hospitals, 5,334 BHUs and Sub-Health Centers, 560 RHCs, 4,712 Dispensaries, 905 MCH Centers and 288 TB Centers. For improvement in services delivery and enhancement of accountability at local level Pakistan effected the implementation of the “Devolution initiative” by devolving administrative and financial powers to districts/local authorities in 2001. The District Health System, operating under the District Government is responsible for planning, development and management including implementation of health care delivery from DHQ hospitals right down to the outreach programs. For restructuring the primary healthcare delivery system the provincial governments have focused on revitalizing the Basic Health Units (BHUs) and Rural Health Centers (RHCs).

The private health sector consists of a diverse group of doctors, nurses, traditional healers, pharmacists, drug vendors, laboratory technicians, shopkeepers and unqualified practitioners. Among the private sector hospitals majority of them are running on sole proprietorship or a partnership mode of organization. The major providers of the out-patient care are stand-alone clinics which are operating all across the country fall in the sole proprietorship category. According to economic census (2001-2003) health provision services includes 96,430 private health establishments, including hospitals, dispensaries, homeopaths, hakims and others.

Majority of the private hospitals are operating in urban areas. There is legislation on the accreditation of doctors, nurses and LHWs; according to the requirement of the law, all providers for health care should be registered with their respective regulatory bodies however in reality this is rarely implemented. Legislation for accrediting institutions like hospitals and quality assurance mechanisms are of no importance and there is no licensing mechanism, also no permission required to open or operate a health care unit. From the latest data of PSLMS about two-thirds of the consultations take place in the private sector.

## SECTION III: ENVIRONMENT

### WATER, SANITATION AND HYGIENE

Water issues spread over various possibilities; management of large dams, spring water sold in small bottles, complex irrigation systems, un-mechanized hand pumps, global water crisis and rain harvesting in peri-urban areas. An urban hydrological system is defined to be regulated to function or malfunction through differing economically transacted systems.<sup>47</sup> Main water sources may include: rain water, ground water sources and river systems. Being the 'lifeblood of ecosystems' water is essential for eco-hydrological purposes: people's livelihoods, well-being and production.<sup>48</sup>

The two most "critical" factors to health are sterile conditions and safe drinking water. Insufficient or inadequate clean water supply can lead to numerous water borne diseases posing major threats to survival and development of human life. The WHO has found through research that 80% of diseases are caused by unhygienic conditions and unsafe drinking water hence to improve health in any country clean drinking water and provision of sanitation are the foremost important steps.<sup>49</sup> Improper excreta disposal and unclean domestic environments are known to be the reason for over three million deaths around the world every year; it has been studied that over 0.884 billion people don't have access to safe water and 2.5 billion lack access to basic sanitation; unsafe drinking water. Furthermore, when it comes to developing countries the statistics get worse; half the populations in developing countries suffer from water-borne diseases such as diarrheal diseases, malaria, schistosomiasis, infections with internal helminthes and river blindness, at any given time.<sup>50</sup> Moreover, 80% of all diseases in developing countries have been associated with the use of polluted water.<sup>51</sup>

The situation is seems to be even worse in the neglected portions of these developing nations such as the peri-urban areas. In peri-urban areas of most developing countries water from rivers, canals and ponds is a common source for bathing, washing of clothes and kitchen utensils, excreta disposal, industrial and other waste disposal, as well as a source of drinking-water. This makes the highly

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<sup>47</sup> Niemczynowicz 1999; cf. McKenzie and Ray 2009; Black and Hall 2004; and Maria 2006

<sup>48</sup> Mehta et al 2007: 1

<sup>49</sup> Economic Survey, Government of Pakistan 2011

<sup>50</sup> Helmer, R. (1999). 'Water quality and health', the Environmentalist,19,11-16

<sup>51</sup> Buchanan, M.K. (2006). Water Privatization and Infant Mortality in the Developing Countries, Honors Thesis, Washington State University: Washington



polluted, virus, pathogenic bacteria and parasite contaminated water in these areas one of the primary sources of disease and infection transmissions and of a wide range of related health issues.

In general, water-related diseases have been classified into six distinct categories depending on the mode of disease transmission, namely:

- Waterborne diseases
- Water-contact diseases
- Vector-borne diseases
- Water-hygiene diseases
- Excreta related diseases
- Poisoning and disabilities related to chemical contamination.<sup>52</sup>

Some studies show that 88% of the urban population has access to clean water supply, 80% have drainage facilities whereas only 20% of the rural population has access to basic facilities (FBS 2002).<sup>53</sup>

The Economic Survey, on the other hand, records that 65% Pakistan’s population has access to safe drinking water. Moreover the document tracked that around 95% of urban and 87% of rural population have access to improved water supplies with 48% households directly connected in cities and 19% connected in rural areas. It also acknowledges there has been a fall of 1% over the past one decade in the number of people who travel more than 0.5km to access drinking water. The Survey hence states that the country is “on track on access to Improved Water Resources”.<sup>54</sup>

Table 2 below shows that among the major cities of Punjab Lahore is better-off than the rest: 65% of Lahore has access to water supply connections as well as sewerage connections. Table 3 shows the distribution and source of water supply in the entire country plus urban and rural supply; it is evident that the source of water in both urban and rural has shifted to inside which means less people have to travel to collect water.

**Table 2 Water Supply and Sewerage Connections in Punjab's Major Cities 2005/06**

Indicators	Faisalabad	Gujranwala	Lahore	Multan	Rawalpindi
No. of Water Supply Connections	104,467	30,125	511,628	33,192	70,020
Water Supply Coverage (percent)	60	28	65	60	75
No. of Sewerage Connections	185,385	89,006	511,628	152,928	80,000
Sewerage Coverage (percent)	52	60	65	55	35

Source: City WASAs.

<sup>52</sup> Helmer, R. (1999). ‘Water quality and health’, the Environmentalist,19,11-16

<sup>53</sup> Metropolitan Growth Monitoring and Landuse Classification using Geospatial Techniques, Amjed S Almas, C A Rahim, M J Butt, Tayyab I Shah. ISPRS Workshop on Services and Application of Spatial Data Infrastructure, XXXVI(4/W6), Oct 14-16, China

<sup>54</sup> Economic Survey, Government of Pakistan 2011

**Table 3 Water Supply Characteristics in Pakistan**

	Piped Water		Hand Pump		Well	Others*	Total
	Inside	Outside	Inside	Outside			
<b>Pakistan</b>							
1973	8.4	8.2	28.8	13.4	26.1	15.1	100
1980	12.6	7.7	34.3	12.3	17.3	15.8	100
1998	28.1	4.2	42.1	5.1	10	10.6	100
<b>Urban</b>							
1973	28.4	26.5	26	7	8.8	3.3	100
1980	38.3	20	27.3	5.6	7.1	1.7	100
1998	60.2	4.8	25.7	1.3	4.4	3.5	100
<b>Rural</b>							
1973	1.3	1.6	29.8	15.7	32.3	19.3	100
1980	2.5	2.9	37	14.9	21.3	21.4	100
1998	13.4	3.9	49.6	6.9	12.5	13.9	100

(Source: State of Population 1988 p-187 and Population Census 1998 Table - 48.)

\* Water supply from ponds, springs, rivers and streams, etc.

**Figure 9 Electrical water motor pump**



Most common source of water in peri-urban areas was the use of hand-pump followed by the use of electronic motors.<sup>55</sup> Networked infrastructure is yet to be seen in peri-urban areas; these neighborhoods usually are not supported with piped water supply and/or sewerage lines. The reason for this lag in development evidently is that majority of population inhabiting in peri-urban regions is poor and hence cannot afford high service or installation costs of networked infrastructure. In some cases it is

seen that the society brings together a mutual fund to construct public places and facilities like clean water plants, mosques or parks.

Most residents of peri-urban areas of Lahore when spoken to by the research team described the quality of water as unsatisfactory based on indicators of taste, smell and color. Additionally, the residents were largely unaware of the benefits of boiling water to improve water quality, and around 79% claimed to not boil water before use.

Over 40% of the peri-urban households (interviewed for this study) are not connected to tap water supply and use pumps to draw water from shallow groundwater sources which also seem to be heavily contaminated as proven through studies of samples. Some 10% of households still source water from

**Figure 10 Hand-pump in peri-urban residence**



<sup>55</sup> In-depth interviews at peri-urban areas

open dug wells which are even more vulnerable to contamination. 25% of Pakistan’s rural population is claimed to have piped water supply but the health concerns of this tap water are still doubtful.<sup>56</sup> As raw sewage, industrial trash and agricultural overspill all over Pakistan disturb and pollute the surface and groundwater sources.<sup>57</sup>



Figure 9 A drain at the back of a peri-urban neighborhood

An alarming concern is the wastewater and sewage flowing into the water bodies near the informal settlements due to absence of proper water management. The excretions usually discharge into empty plots forming soak-pits polluting aquifers. Shallow aquifers are tapped for water in these areas raising serious health concerns.<sup>58</sup> It has been reported that less than

1% of wastewater is treated in Pakistan with the remainder flowing openly into ravines, streams and rivers.<sup>59</sup>

Table 4 Groundwater Quality Status in Different Groundwater Monitoring Units of Punjab, 2005 (Area in

Groundwater Monitoring Units	EC > 1.5 = Unfit			SAR > 10.0 = Unfit			RSC > 2.5 = Unfit			Status		
	Fit	Unfit	percent Unfit	Fit	Unfit	percent Unfit	Fit	Unfit	percent Unfit	Fit	Unfit	percent Unfit
Lahore	1,675,810	356,486	18	1,869,771	162,528	8	1,294,727	737,572	36	1,206,283	826,014	41
Bahawalpur	973,215	1,963,974	67	1,999,800	937,357	32	2,369,352	567,840	19	795,169	2,141,994	73
Sargodha	637,866	440,983	41	858,036	220,813	20	754,746	324,104	30	546,612	532,238	49
Dera Ghazi Khan	790,922	926,396	54	1,394,023	323,295	19	1,625,153	92,166	5	751,804	965,514	76
Faisalabad	825,015	960,816	54	1,083,877	705,954	39	1,031,031	758,802	42	710,446	1,079,386	60
Thal	1,182,685	1,303,685	52	1,602,956	883,414	36	2,109,481	376,890	15	1,070,947	1,415,423	57
Multan	1,509,905	961,041	39	2,132,543	338,400	14	2,137,717	333,226	13	1,366,572	1,104,371	45
Punjab	7,599,419	6,913,381	48	10,941,006	3,571,761	25	11,322,205	3,190,599	22	6,447,832	8,064,940	56

ha) Source: Directorate of Land Reclamation, Punjab, I&PD, Canal Bank Moghalpura, Lahore.

<sup>56</sup> Country Environment Analysis, Asian Development Bank. December 2008

<sup>57</sup> Economic Survey, Government of Pakistan 2011

<sup>58</sup> See IUCN reports on environment and development for the Pakistan provinces.

<sup>59</sup> Urbanization and Local Governance Challenge in Pakistan, Murtaza Haider and Madhav G. Badami, 2010

Area	Bath Room			Latrine		
	Separate (%)	Shared (%)	None (%)	Separate (%)	Shared (%)	None (%)
PAKISTAN	33	23	44	29	20	51
NWFP	34	24	42	25	18	57
FATA						
PUNJAB	32	18	50	27	16	58
SINDH	34	31	35	35	31	34
BALUCHISTAN	27	42	32	19	29	52
ISLAMABAD	59	17	24	55	17	28

**Table 5 Sanitation Facilities in Pakistan (Census, 1998)**

More than half of the urban sewage is not seen to drain through sewers or/and covered drains. In addition treatment is provided on a diminutive scale to this waste before it is discharged into nearby water bodies. This contamination further squeezes the chance of access to clean water supply which

already is bleak.<sup>60</sup> Blocked drains frequently flood on the roads infecting the city with smell and illnesses.<sup>61</sup> A peri-urban resident narrated: *“sewerage paths are more than often blocked no organization or authority seems to care; once a dog died in the nalli and the stench was unbearable after 3-4 days we privately called a young boy who cleaned it for Rs. 15”*.

The inadequate and poor sewerage system, common in such areas, gives rise to cholera, typhoid and other health implications.

Access to sanitation facilities in Pakistan is also problematic. Not as much as 50% of the population has access to toilets with 20% of households sharing toilets. In Punjab only one out of four households has access to adequate sanitation facilities. In cases where the households have access

to toilets infrastructure lacks resulting in untreated waste converting rivers and streams into sewers.<sup>62</sup> A useful presentation is given below in Table 5: Punjab has the second lowest percent of separate bathrooms (32%), shared bathroom (18%) and half the population has no bathrooms. As for latrines: 27% enjoy separate latrines, 16% shared and 58% with no latrines.

The sanitation facilities in the country stand weak and feeble; encouraging the frequency and number of diseases. Human stool of the country’s growing urban population travels through open drains. What’s more, due to unavailability of toilets the rural population defecates in fields nearby this is also common in peri-urban areas where children as well as adult men are seen urinating on the streets. Besides people’s hands and feet houseflies are also frequent carriers of germs to houses.<sup>63</sup>

**Figure 10 Shared sink in peri-urban residence**



<sup>60</sup> Country Environment Analysis, Asian Development Bank. December 2008

<sup>61</sup> Pakistan Urban Sector Strategy Study. June 2000. Government of Pakistan

<sup>62</sup> Urbanization and Local Governance Challenge in Pakistan, Murtaza Haider and Madhav G. Badami, 2010

<sup>63</sup> Country Environment Analysis, Asian Development Bank. December 2008

## SOLID WASTE

Streets are the main recipients of pollution in Pakistan. Over 50% of solid waste is left in streets to rot while a small percentage is recovered by metropolitan governments in the urban regions<sup>64</sup>; about 48000 tons of garbage is thrown out on the streets every day. Out of this huge lump of waste recyclable materials are only partially segregated that too only in posh urban centers. The waste is a mix of domestic, trade and industrial litter; usually consisting waste paper, plastic, metal, glass, rubber and rags. Once it is dumped on the streets municipal collection is even more mishandled with no clarity or ownership of responsibility. After collection trash is dumped into low-lying land polluting the groundwater or incinerated creating air pollution. Waste burnt in open spaces, at low temperatures, fires up dust and carcinogenic pollutants with adverse health implications.<sup>65</sup> The lack of proper waste disposal mechanism is a pressing matter as it causes faecal contamination of groundwater.<sup>66</sup>

**Figure 11 Solid waste dumped on an empty plot in the middle of houses (peri-urban area)**



In the visits to Lahore it was found that there is no basic or formal waste collection system operating in the peri-urban areas; however in the peri-urban areas occupied by the industrial estates there seems to be a formal solid waste management system which is the responsibility of authorities of respective industrial estates. Moreover, the industrial estates have a proper water supply system and sewerage network along with primary and secondary wastewater treatment plants in some of the industries. The communities existing within the industrial estates also benefit from these facilities. Similarly, some of

<sup>64</sup> Urbanization and Local Governance Challenge in Pakistan, Murtaza Haider and Madhav G. Badami, 2010

<sup>65</sup> Country Environment Analysis, Asian Development Bank. December 2008

<sup>66</sup> On the edge of sustainability: perspectives on peri-urban dynamics, Fiona Marshall, Linda Waldman, Hayley MacGregor, Lyla Mehta and Pritpal Randhawa. Economic and Social Research Council. 2009

the areas close to the city boundaries also get the basic water and sanitation services despite technically living beyond official city limits. For waste removal in other peri-urban areas which do not lie within or are not overseen by industrial estates, the informal sector is involved in *scavenging* activities: the ‘scavengers’ collect and sort the waste from open heaps, either for a wage rate or for recycling purposes, thus leading to health risks and infections.

Lahore was once a city famous for its parks and gardens, today it is the most congested and polluted city of the country. The City District Government (CDG) has the capacity to process 3853 tons of waste while alone nine towns of Lahore generate 4726 tons of trash; the surplus remains on the streets. Some of the waste lifted by CDG is dumped in disposal sites while the major chunk ends up in low-lying areas in and around the city. The poor management of the waste is not only due to poor physical infrastructure but it also owes to lack of human and monetary resources; Rs. 500 are spent per ton of solid waste every day.

**Table 6 Manpower Status of Waste Collection/Transportation and Cleaning**

City	Area (km)	Population (million)	No of Sanitary Workers	Population per Sanitary worker
Lahore	1,7772	8.00	10,745	744
Multan	495	2.20	1,6660	1,325
Gujranwala	368	1.50	1,274	1,177
Sialkot	276	1.25	1,124	1,112
Rawalpindi	175	1.00	990	1,010
Faisalabad	589	2.14	NA	NA
Sargodha	268	0.55	804	684
D.G. Khan	170	0.26	395	658
Bahawalpur	184	0.50	NA	NA

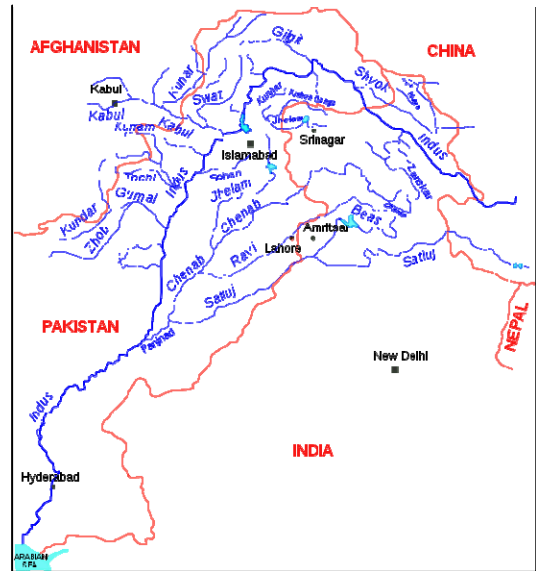
Source: Improving Solid Waste Management in Punjab, Pakistan, Ernst Basler and Partner, 2006 as quoted in Urban Unit “Training o Integrated Solid Waste Management

## **INDUSTRIAL WASTE IN THE DRAINS OF LAHORE**

Geographically the city of Lahore shares its border with Amritsar; Wagah border. Wagah is the only road border between Pakistan and India. One of the six rivers of the Indus system in the Punjab region is the Ravi River. After partition in August 1947 the waters of Ravi along with other rivers of the Indus system were divided between the two countries under the Indus Water Treaty. Lahore receives River Ravi from 26 km below Amritsar; the 725 km long Ravi River is a trans-boundary river flowing through the Northwestern India and eastern Pakistan

Along with River Ravi some of its drains bring into Pakistan heavily polluted squander from India. The wastes are mainly industrial effluents proven to be toxic. The Hudiara drain is one of the most affected drains owing mainly to industrial and agricultural waste coupled with poor drainage systems in both countries. The drain is a natural storm-water channel originating from Gurdaspur district, India.<sup>67</sup> It was recorded in 2001 that Hudiara drain transmitted 45 tons of biological oxygen demand and 326 tons of dissolved solids into Ravi after flowing 55 km inside Pakistan.<sup>68</sup> The Food and Agriculture Organization (FAO) claimed that concentration of cadmium, manganese and copper in the drain's water exceed permissible limits for irrigation let alone drinking.<sup>69</sup>

Figure 12 Indus System



Industries persistently release heavy metals and synthetic organic chemicals which are toxic to precious natural resources including land and water bodies. The effluents pollute rivers, fresh groundwater and arable land while industrial dumping sites hold large doses of heavy metals and persistent chemicals which penetrate into the groundwater sources contaminating it.<sup>70</sup> Pollution from industries exposes the residents of peri-urban areas to a variety of liquid waste risks in the form of effluents, GW contamination and water pollution.

The major industries contributing heavily to environmental degradation include: chemicals, pesticides, textiles, pharmaceuticals, cement, electrical and electronic equipment, glass and ceramics, pulp and paperboard, leather tanning, food processing, and petroleum refining. The National Profile on Chemical Management asserts that chemical industries throw out their effluents in nearby drains or other outlets without any prior treatment.<sup>71</sup> Industries conveniently dump their solid waste on the roads from where CDG facilities collect it not charging the industries a penny.<sup>72</sup>

<sup>67</sup> Pakistan Urban Sector Strategy Study. June2000. Government of Pakistan  
<sup>68</sup> [http://www.wfpak.org/toxics\\_hudiaradrain.php](http://www.wfpak.org/toxics_hudiaradrain.php)  
<sup>69</sup> Pakistan Urban Sector Strategy Study. June2000. Government of Pakistan  
<sup>70</sup> Country Environment Analysis, Asian Development Bank. December 2008  
<sup>71</sup> Punjab Economic Report 2007, Government of Pakistan  
<sup>72</sup> Punjab Economic Report 2007, Government of Pakistan

Small-scale industries exist in the peri-urban areas of Lahore from where industrial waste is disposed off in the nearby rivers and drains.<sup>73</sup> In the peri-urban areas around industrial zones, contamination of the soil by heavy metals is a major threat. Apart from that, two of the industrial estates (in Kasur and Raiwind) have occupied some of the peri-urban area and the industrial wastewater discharged by these estates is directed into the nearby drains, ultimately flowing into River Ravi. However, several small and large scale industrial wastewater treatment plants do exist in Lahore, e.g. Activated sludge process in CCBPL, CETP in Sundar Industrial Estate, and Trickling filters in ICI. They follow the quality guidelines as prescribed by the National Environmental Quality Standards (NEQS) for effluents.

In 2004, Compendium on Environment Statistics of Pakistan was released by the Government. Still lack of information remains a major issue: Pakistan does not have data on source, volume and characteristics of industrial pollution even though the task is part of the country's MDGs. Without adequate information authorities are not in any position to assess and counter problems of industrial waste. Non-governmental studies show that discharge from industries in Lahore contains large amounts of solids, heavy metals, aromatic dyes, inorganic salts and organic materials. The waste is directly discharged into municipal sewers destroying agricultural land that the drains flow through, for example Hudhara Drain. The drains also permanently contaminate shallow groundwater sources; it takes hundreds or even thousands of years to wash out pollutants such as toxic metals from tanneries.

Industries can manage their waste effluents through process controls, waste recycling, or end-of-pipe treatment but none of these practices are being followed in Pakistan. A study conducted in 1985 surveyed 100 plants in the country and found that only three of the multinational companies treated their waste that too merely up to commonly accepted standards.<sup>74</sup> It has been recorded that industrial waste usually holds high levels of organic matter and hydrochloric acid. The effluents are dropped into streams and canals where biological oxygen demand levels range between 193 and 833 mg per liter and mercury levels of 5.6 mg per liter while the indicators proposed in the Compendium are 200 and 0.1 respectively.<sup>75</sup> The disparity between the figures proposed and those that exist in reality is highly unfortunate for the country. Water ways which carry these effluents are proved harmful for irrigation

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<sup>73</sup> According to information derived from discussions with the Punjab Urban Unit solid waste management specialists.

<sup>74</sup> Ibid.

<sup>75</sup> Punjab Economic Report 2007, Government of Pakistan



use and livestock consumption. The polluted water endangers aquatic beings as well: it has been found that industrial waste has caused an annual reduction in the fish catch of 400 tons worth Rs.10 million.<sup>76</sup>

It is evident from the table below (Table 7) that the highest level of industrial waste among 21 cities of Punjab is that of Lahore; 120 cusecs. It was also recorded from 151 industries in Lahore only 2 treat their waste.<sup>77</sup>

Table 7 District-level Detail of Industrial and Municipal Discharge in Punjab

District	No. of Industries	Effluent from Industries (Cusecs)	Effluent from Municipalities (Cusecs)	Total Effluent (Cusecs)	Treated	Untreated
Faisalabad	123	70.0	145	215	1	122
Lahore	151	120.0	3,126	3,246	2	149
Hafizabad	2	0.5	15	15.5	-	2
Gujranwala	55	37.0	63	100	-	55
Sialkot	39	24.7	3	27.7	-	39
Kasur	23	21.4	43	64.4	-	23
Sheikhupura	100	70.0	80	150	1	99
Mandi Bahauddin	11	7.1	30	37.1	-	11
Gujrat	4	1.0	39	40	-	4
Sargodha	26	8.5	71	78.5	-	26
Jhang	9	5.6	6.5	12.1	-	9
Khanewal	4	7.0	2.4	9.4	1	3
Multan	9	5.0	2,04.8	209.8	-	9
Lodhran	1	-	-	-	-	1
Bahawalpur	4	nd	7	7.0	-	4
Bahawalnagar	2	nd	nd	nt	-	2
Rahim Yar Khan	4	9.0	-	9.0	-	4
Dera Ghazi Khan	2	-	60	60	-	2
Muzaffargarh	7	25.0	8	33.0	3	4
Sahiwal	2	nd	nd	nd	nd	nd
Toba Tek Singh	1	3.0	-	3.0	-	1
Total	-	414.7	3,903.7	4,318.4	-	-

Source: Government of Pakistan (2006).

nd - Non disclosure

nt - Not tested

## WATER SCARCITY

Aquifers seem to be unable to match the increasing demand. The withdrawal limits of freshwater sources have finite limits; unfortunately Pakistan has already touched upon these limits of its surface and groundwater sources. It was recorded that the per capita availability of water has decreased to 1100 cubic meters (m<sup>3</sup>) per person per year in 2007 from 5300 m<sup>3</sup> in 1951. With the increase in

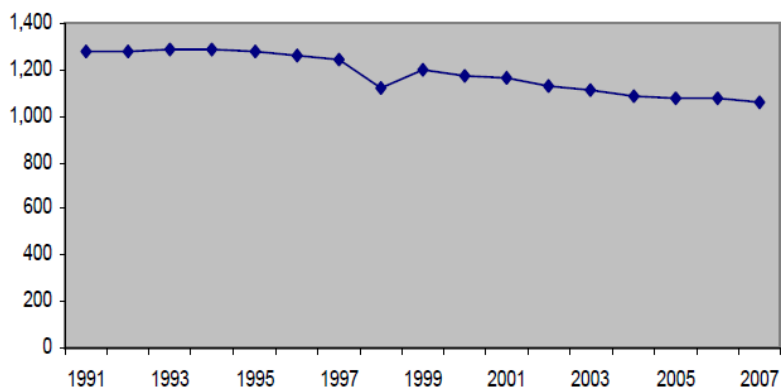
<sup>76</sup> Punjab Economic Report 2007, Government of Pakistan

<sup>77</sup> Punjab Economic Report 2007, Government of Pakistan

population and extensive use of water the country is soon to become water stressed; meaning per capita water availability will fall to less than 1000 m<sup>3</sup> per person per year.<sup>78</sup>

The natural resource depletion, compensation for future generations' social and cultural loss, water's affects on well-being and the financial or institutional loss cannot be calculated. Although these issues have been raised in extensive debates of sustainability around the globe but it has been clearly pointed out that it is impossible to assess the costs or scale. The birth of peri-urban surroundings, whether in the form of expansion of a city or villages being absorbed into a city, has further stretched the water scarcity problem. The demand for water and the fight over its use intensifies with urbanization facing pressures from agricultural, local non-farm and urban demands. The changes in land use and the increase in demand for water from industries further stresses water availability in the area, more specifically availability of clean water becomes an issue in unplanned peri-urban areas.

Figure 13 Availability of water resources (per capita)



Source: Government of Pakistan. 2007. *Pakistan Economic Survey 2006-2007*. Islamabad: Ministry of Finance.

Water is a scarce resource, which cannot be manufactured and will always be demanded for its multiple uses and non-substitutability. The resource cannot be controlled and is variable across both time and spaces.

## SOIL AND AGRICULTURE

Impromptu development is seen to take over much of the agricultural land. With the end of old caste system and feudal institutions agricultural infrastructure also fell apart rising problems of natural resources as well. Forest land and water resources are no longer managed or maintained by the traditional institutions causing grievances particularly in environmentally fragile districts. The lack of

<sup>78</sup> Country Environment Analysis, Asian Development Bank. December 2008

maintenance has also led to increase in vulnerability to natural disasters including droughts, famines and floods.<sup>79</sup>

It has been noted that fertile land every year turns into barren land leading to poverty, unemployment and food crisis. Issues of land degradation include deforestation, desertification, sodicity, salinity, water logging, soil erosion, negative nutrient balances and depletion of solid fertility. Studies show that in Pakistan 60% of natural grazing area holds production levels one third lower than its actual biological potential. Environmental implications on crop yields such as water-logging and salinity result from poorly managed irrigation. After the monsoon season 25-30% of the irrigated canals are seen to be water-logged while over 8% of the nation’s land endures severe salinity. Moreover, irrigation causes 1.7 tons of salt deposits per hectare every year. The Economic Survey also notes 11 million hectares of arable land is affected by water logging and 3 million hectares of the country are affected by salinity and sodicity. The effluents from water-logged and saline fields harm ecosystems. Tube wells reduce the extent of water-logging but the use of groundwater holding high deposits of salts leads to sodicity affecting crop yields; mostly clayey soils. Moreover, as the level of fresh groundwater falls it allows interference of brackish water from surrounding areas causing deterioration in quality of groundwater.<sup>80</sup>

**Table 8 Soils Affected by Various Types of Salinity and Sodicity (in million hectares)**

Type of Soil	Punjab	Pakistan
<i>Soils with surface/patchy salinity and sodicity</i>		
<i>Irrigated</i>	0.472	0.598
<i>Un-irrigated</i>	-	-
<i>Gypsiferous saline/saline-sodic soils</i>		
<i>Irrigated</i>	0.152	0.972
<i>Un-irrigated</i>	0.124	0.820
<i>Porous saline sodic soils</i>		
<i>Irrigated</i>	0.790	1.103
<i>Un-irrigated</i>	0.501	1.023
<i>Dense saline sodic soils</i>		
<i>Irrigated</i>	0.0977	0.130
<i>Un-irrigated</i>	0.530	1.633
<b>Total:</b>	<b>2.667</b>	<b>6.281</b>

Source: S&R Directorate, SCARP Monitoring Organization, WAPDA Lahore, 2001-03

According to the table above (Table 8), the total soil affected by salinity and sodicity in Pakistan is 6.281 million hectares, out of this 2.667 million hectares lie in the Punjab province. That is over 40% of the total land affected by soil salinity and sodicity in the country is that of Punjab.<sup>81</sup>

<sup>79</sup> Arif Hasan (2002), *The Unplanned Revolution*, City Press, Karachi.

<sup>80</sup> Country Environment Analysis, Asian Development Bank. December 2008

<sup>81</sup> Punjab Economic Report 2007, Government of Pakistan

Soil erosion is also a disturbing dilemma in Pakistan. Moving water, wind or ice can cause removal of surface soil material known as soil erosion. Soil loses its stability mainly due to deforestation. Water erosion is seen to most common to areas of slopes such as the Potohar track; rate of erosion hiked up to 150-165 tons per hectare annually. Furthermore, it was been recorded in 1990 that the Indus River carries one of the five largest sediments in the world; amounting to 4.49 tons per hectare. Indus is bringing 500,000 tons of sediment every day to the Tarbela Reservoir cutting down the dam's verve by 22% and diminishing its capacity by 16%. Wind erosion alone is not as harmful but the grouping of wind and water erosion together is disastrous to the soil reducing land productivity by 1.5-7.5% per year. Studies show that one-fifth of Punjab's land is affected by such erosion.<sup>82</sup>

**Table 9 Area Affected by Water Erosion (in million hectares)**

Degree of erosion	Punjab	Pakistan
Slight (sheet & rill erosion)	0.061	0.328
Moderate (sheet & rill erosion)	0.896	3.635
Severe (rill, gully and/or stream bank erosion)	0.588	5.640
Very severe (gully, pipe & pinnacle erosion)	0.357	3.446
Total	1.904	13.050

Source: Directorate of Soil Conservation, Punjab, Lahore

**Table 10 Area Affected by Wind Erosion (in million hectares)**

Degree of erosion	Punjab	Pakistan
Slight	2.251	2.595
Moderate	0.279	0.469
Severe to very severe	1.274	3.081
Total	3.804	6.173

Source: Directorate of Soil Conservation, Punjab, Lahore

<sup>82</sup> Punjab Economic Report 2007, Government of Pakistan

As seen from the tables above (Table 9 and Table 10) it can be determined that wind erosion amounts to 6.173 million hectares from which 60% takes place in Punjab. Water erosion affects more land across the country but since Lahore is a level alluvial plain with only a gentle slope towards south-west and relief of micro order less water erosion is experienced in this region (1.904 million hectares) when compared to other areas of Pakistan.<sup>83</sup>

65% of irrigation water is runoff; efficiency in the process is criticized heavily as two thirds of water diverted from rivers to canals, distributaries, and farmers' fields is lost in passage, delivery and application. It is further criticized that agriculture started using external inputs at an increasing rate after the "green revolution" of 1960s. Use of fertilizers from 1991 to 2006 has doubled from 1.9 million to 3.8 million nutrient tons while returns to per unit use of fertilizer have decreased. Fertilizers sink into the soil causing eutrophication of natural water bodies and toxic algal blooms. Lack of expertise and understanding of risks of cyanobacteria-produced toxins is by itself a hazard for the country: drinking water containing high levels of nitrates can cause "blue baby" syndrome, fish farms have been destroyed completely as pesticides enter the downstream water bodies; these pesticides are persistent and bio-accumulate in organisms hence impacting the fish. The gravity of contamination and its results must be understood on a national level and on individual levels. Furthermore, it has been found that use of artificial hormones and other drugs used in animal production has severe environmental impacts: poisoning and eradicating of bird species such as vultures.<sup>84</sup>

Organic matter is crucial for croplands; not only is it important for the physical structure of soils but in fact it is a medium for biological processes. The purely mineral content of soils contains nutrients that cannot be used by plants until processed by soil microorganisms. Today 96% of Punjab's land is deficient in organic matter content. By endowing the farmers with packages of seed, fertilizer and water the "green revolution" resulted in neglect and disregard of organic manure. Uniform cultivars of staple crops recognized by high-yield characteristics have come into being with development of global market at the price of aboriginal, 'indigenous' crop genetic varieties and 'coarse grains'. Furthermore, there is no law, legislation or regulation to protect these. The importance of these cultivars and less favored crops is high as these staple crops are genetically resistant to salinity and climate change hence holding more chances of sustainability in future. The extended use of pesticides is harmful to not only soil but

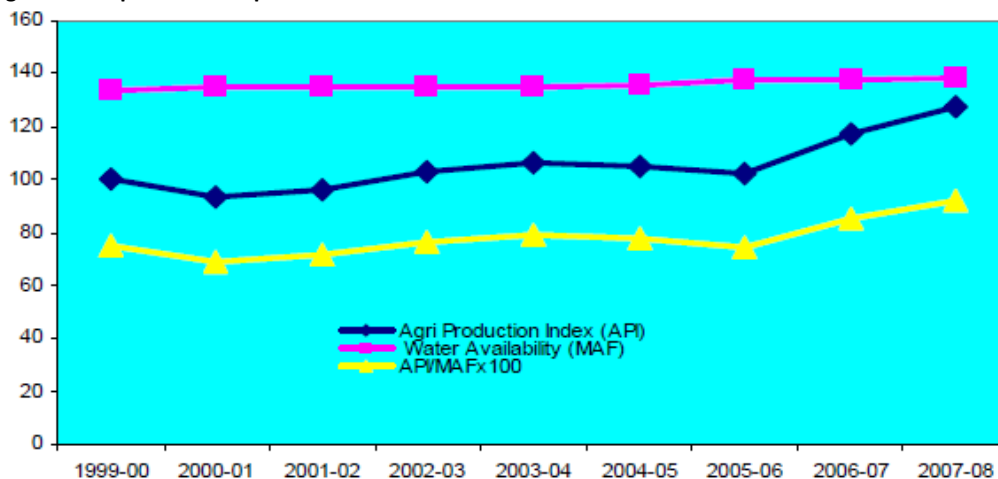
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<sup>83</sup> Punjab Economic Report 2007, Government of Pakistan

<sup>84</sup> Country Environment Analysis, Asian Development Bank. December 2008

also to fauna as well as humans: it disturbs natural biotic balance of agricultural soils, runoff in water bodies affects aquatic beings and fish-eating birds and bioaccumulation of synthetic chemicals up the food chain ultimately can be proven to be toxic for humans.<sup>85</sup> The soil also seems to show deficiency of phosphorous and potassium due to use of nitrogenous and phosphate fertilizers.

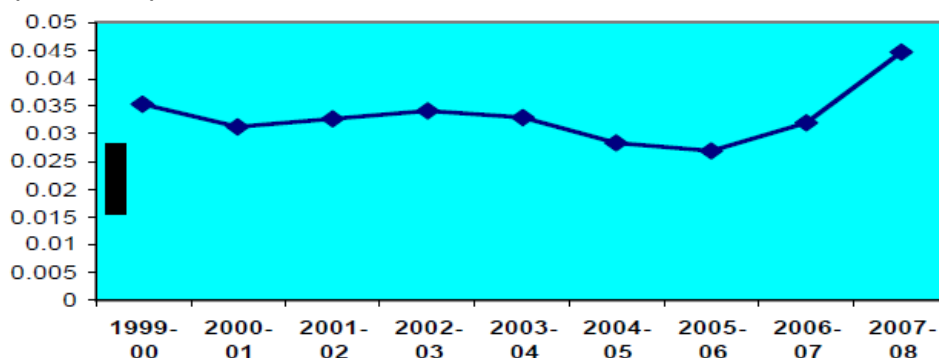
Figure 14 Crop Production per unit of Water Available



API = agriculture production index, MAF = million acre-feet.

Source: Government of Pakistan. 2007. *Pakistan Economic Survey 2006-07*. Islamabad: Ministry of Finance.

Figure 15 Crop Production per unit of Fertilizer



Source: Government of Pakistan. 2007. *Pakistan Economic Survey 2006-07 and 2007-08*. Islamabad: Ministry of Finance.

Available

Intensive agricultural activities take place in the peri-urban areas where farmers use both chemical fertilizers and manure. The areas are dominated by *Gawala* (milk-producing) Colonies and farmland where stables for milk producing animals exist. Food sources are contaminated, which has many possible health impacts, due to lack of awareness of hygiene and proper food storage, leading to food contamination.

<sup>85</sup> Country Environment Analysis, Asian Development Bank. December 2008

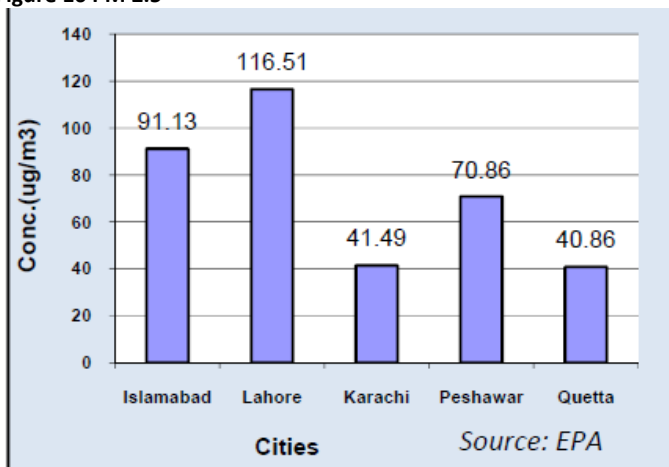
## AIR AND NOISE

Besides diseases linked to water and sanitation, an estimated 1.6 million people around the world die annually from respiratory diseases linked to the use of solid fuels for cooking and heating indoors, most of which also occur in parts of the developing countries (peri-urban areas, rural areas, urban slums) which do not have access to cleaner and safer network infrastructure facilities.

Air in Pakistan is shown to contain excessive amounts of suspended particulate matter (SPM). Strong concentrations of SPM can cause numerous health impacts including respiratory diseases and heart ailments. The sources of this hazardous matter include vehicles industry, burning of solid waste, brick kilns and natural dust. Urbanization causes disturbance of soil giving rise to dust clouds; construction roads or the dust blown from motor vehicles driven on unpaved land.

Pakistan Environmental Protection Agency (Pak-EPA) has conducted many studies on air, water and noise: a research was carried out on the quality of air in five capital cities of Pakistan including Lahore. It was found that the level of particulate matter size below 2.5 micron (PM) was 4.7 times higher than the safe limit described by National Environmental Quality Standards (NEQS).<sup>86</sup> To evaluate sulfur dioxide levels on international environment air quality standards (EAQS) Punjab Urban Unit measured the level in Lahore (at Lohari Gate): Lahore's SO<sub>2</sub> concentration is 2.1 times higher than the Japanese standard and 1.8 times higher than WHO guidelines.<sup>87</sup> Furthermore, another common phenomenon is the creation of sulphates and photochemical smog.

Figure 16 PM 2.5



<sup>86</sup> Economic Survey 2011, Government of Pakistan

<sup>87</sup> Punjab Economic Report 2007, Government of Pakistan

**Table 11 Annual Mean Values of Suspended Particulate Matter (PM 2.5) from Jun 2010-May 2011**

<b>Sr. No.</b>	<b>City</b>	<b>Level (ug/m3)</b>
1	Islamabad	91.13
2	Lahore	116.51
3	Karachi	41.49
4	Peshawar	70.86
5	Quetta	40.86

*Source: Environment Protection Agency (EPA)*

It was found that SPM in Lahore in 2001 was four to seven times higher than that recommended by WHO. Sulfur dioxide is hazardous for humans, animal and plant life, the main source of this gas is industrial emissions, many of these industries are seen to be located on the fringes of Lahore. Moreover brick kilns spotted in the district of Lahore process by low-grade coal, which is the basis of soot.<sup>88</sup> Industrial emissions and barbaric disposal of waste are the main factors causing serious degradation of air quality in Lahore, followed by formation of smog through incineration of municipal and healthcare waste in open bins; which is a common trend in the city.

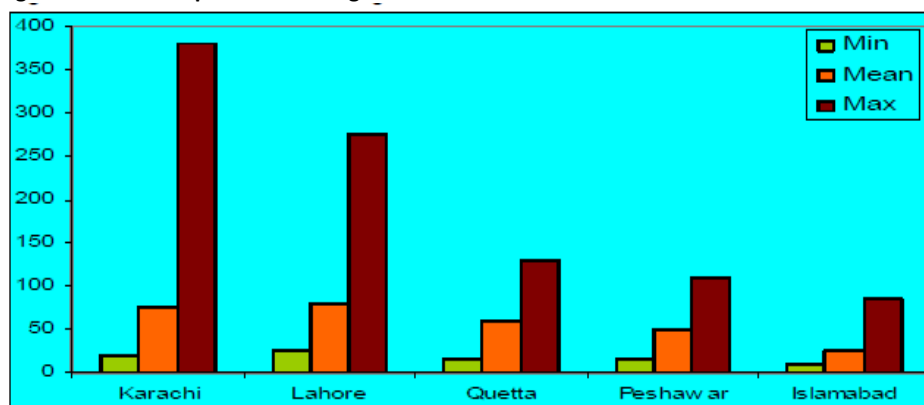
Increased urbanization in peri-urban areas, previously open agriculture areas, has led to increase in the use of motor vehicles consequently increasing air pollution. Due to absence of adequate and decent public transport systems the number of private vehicles has rose incredibly, distressing air quality in Lahore. The population and traffic escalation has plagued development causing severe congestion. The traffic of Lahore consists of luxury cars, motor bikes, two-stroke rickshaws, auto-rickshaws, motor-cycle rickshaws, diesel-run wagons, buses, donkey carts, man carts, bicycles and pedestrians; this diversity of transport types makes the already poor traffic management even more strenuous.<sup>89</sup> The pollution is hazardous to the residents of Lahore; Pakistan Medical and Dental Association has reported high levels of lead in blood samples collected from school children, traffic police officials and adult population of the area.

<sup>88</sup> Country Environment Analysis, Asian Development Bank. December 2008

<sup>89</sup> Pakistan Urban Sector Strategy Study. June2000. Government of Pakistan



Figure 17 Urban air pollution: Nitrogen Dioxide Concentrations in Pakistan's Main Cities



Source: Pakistan Environmental Protection Agency and Japan International Cooperation Agency, 2006. *Measurement of Ambient Concentration of NO<sub>2</sub> in Different Cities of Pakistan Using Diffusion Samplers*. Islamabad: Ministry of Environment.

Vehicles are seen to emit various gases including carbon monoxide, nitrous oxides. Nitrous oxides are emerging air pollutants with highest concentrations in Lahore after Karachi. The concentration of nitrogen oxides in the city is ten times higher than that set out standards by WHO: standard set by WHO is 106 ppb while level recorded in Lahore was 328 ppb. Diesel-powered vehicles release poly-aromatic hydrocarbons, also known as carcinogens, furthermore these vehicles discharge smoke which has caused increase in the levels of airborne soot.<sup>90</sup> Two-stroke motorcycles and rickshaws burn fuel most inefficiently they let out very fine inhalable particles that settle in lungs and cause serious respiratory diseases. In 2006 the Lahore High Court banned two-stroke rickshaws from five cities of Punjab including Lahore.<sup>91</sup> Still the two-stroke vehicles industry has increased by 142.6% in 2010-11 from 2000-01: the number of rickshaws has risen by 24% while motorcycles and scooters have actually doubles since 2000-01.

Many agree that the main cause of air pollution is the sudden increase in use of vehicles added with inefficient and outdated automotives and dirty fuels. Motor Vehicle Examiners (MVE) do exist but they don't have any facilities to scientifically check fitness or emissions of vehicles, currently only commercial vehicles are checked. A model is under construction for vehicle examination and emission testing for all public and private vehicles.

Cleaner fuels have been introduced and are being used in Pakistan for instance, compressed natural gas (CNG) and diesel with lower sulphur content. A ban was imposed on leaded gasoline and sulphur content in diesel was reduced to 0.6% from 1% in the year 2000. Since 2005 lead has been excluded

<sup>90</sup> Country Environment Analysis, Asian Development Bank. December 2008

<sup>91</sup> [http://www.dailytimes.com.pk/default.asp?page=2010\06\19\story\\_19-6-2010\\_pg13\\_9](http://www.dailytimes.com.pk/default.asp?page=2010\06\19\story_19-6-2010_pg13_9)

from all brands of gasoline on the regular retail market in Pakistan predicted to lower levels of lead ethyl. A very common trend in the past few years has been the conversion of petrol-based vehicle engines to CNG based; in fact Pakistan holds the maximum number of vehicles running on CNG in South Asia, and the third worldwide. Environmentally this is a huge achievement for Pakistan but this has led to a grave energy crisis.<sup>92</sup> Over three thousand stations are providing CNG in Pakistan to over 2.5 million vehicles. Now the government is looking to replace the diesel fuel which pollutes the environment more than petrol. Pakistan is the largest used of CNG in the world. The government has also worked to introduce CNG buses in Lahore along with other major cities.



Figure 18 Wood used for cooking in peri-urban residence

Sulfur dioxide, nitrogen oxide and carbon dioxide emissions from vehicles are not the only source of urban pollution; the traffic causes high levels of noise pollution as well. Moreover NESPAK has claimed that recommended standard of noise ought to be 85 dbs while in Lahore the noise spreads over to 80-90 dbs.<sup>93</sup>

Indoor air pollution is also a grave issue being overlooked currently; there is almost no data on the topic. The lack of information is due to the fact that pollution control authorities are poorly staffed, are short on technical resources and most importantly like all other authorities these authorities are too subject to political pressures.

Most households on fringes of Lahore, in peri-urban areas, use biomass as fuel due to lack of or no access to modern energy services. The use of biomass fuels in unventilated or inadequately ventilated rooms is the key source of indoor air pollution. It has been recorded that 86% of rural households and 32% of urban households are using biomass fuels for cooking. This cooking practice may lead to acute respiratory infections particularly in the vulnerable; women and children. Straightforward solutions like

<sup>92</sup> Country Environment Analysis, Asian Development Bank. December 2008

<sup>93</sup> Pakistan Urban Sector Strategy Study. June 2000. Government of Pakistan

use of hoods or vents have been suggested to counter the indoor air pollution but information dissemination to these small households still remains scarce and infrequent.<sup>94</sup>

Due to the unavailability of kitchens at homes, 79% of the residents of the areas were found to cook their food in the open, rendering the food items and utensils vulnerable to environmental contamination and contact with disease causing pathogens. Once the food has been cooked it is usually stored in the open since refrigeration facilities are mostly unavailable. Additionally, some of the residents keep their livestock indoors, and the existence of animal feces and waste within the house has also been reported. In such an environment, storing the food in the open increases the risk of spoilage and contamination, further increasing health risks.

A positive aspect is that there is a significant decrease in the use of coal; many power sector plants have now shifted to natural gas, coal use has also decreased for domestic purposes. However, coal along with old tyres are still being used in brick kilns, the process generates black smoke (soot) in addition to other emissions. In fact as evident from the table below (Table 12) use of coal in brick kilns has increased by 19.2% in 2009-10 as compared to 2000-01.

**Table 12 Consumption of Coal (000 M/Tons)**

Year	Power	Bricks Kilns	Household
2000-01	205.8	2837.9	1.0
2001-02	249.4	2577.5	1.1
2002-03	203.6	2607.0	1.1
2003-04	184.9	2589.4	1.0
2004-05	179.9	3906.2	-
2005-06	149.3	4221.8	-
2006-07	164.4	3277.4	1.0
2007-08	162.2	3760.7	1.0
2008-09	112.5	3274.8	0.8
2009-10	125.1	3382.7	-
2010-11 (July-March)	44.6	3305.5	-

*E : Estimated, - : Not Available*

*Source: Hydrocarbon Development Institute of Pakistan*

The Economic Survey 2011 does claim that to take effect mitigation steps ambient air quality is being assessed through air monitoring stations in all major cities of Pakistan. Important landmarks in the arena include: conversion of over two million vehicles to CNG, NEQS for Industrial Gaseous Emission (2000) are placed, NEQS for Motor Vehicle Exhaust and Noise (2010) and NEQS for ambient air are approved. Besides this, the (EX) Ministry of Environment announced that all petrol driven vehicles

<sup>94</sup> Country Environment Analysis, Asian Development Bank. December 2008

imported or manufactured locally will comply with Euro-II emission standards with effect from July 2009, models not complying will have to switch to the Euro-II models within three years, also all diesel driven vehicles (imported or manufactured locally) will comply with Euro-II standards with effect from July 2012. The important point of this announcement was that the decision was taken with consultation of Ministry of Petroleum and Natural Resources, Engineering Development Board, Pakistan Automobile Manufactures Associations and other stakeholders. Further it was announced that Ministry of Petroleum and Natural Resources will ensure availability of Euro-II complaint diesel, with sulphur contents 0.05%, with effect from January, 2012.

**Table 13 Motor Vehicles on the Road (000 Nos)**

<b>Year</b>	<b>Total</b>	<b>Motorcycles/Scooter</b>	<b>Rickshaws</b>
2000-01	2291.3	2218.9	72.4
2001-02	2561.9	2481.1	80.8
2002-03	2737.1	2656.2	80.9
2003-04	2963.5	2882.5	81.0
2004-05	3144.5	3063.0	81.5
2005-06	3868.8	3791.0	77.2
2006-07	4542.8	4463.8	79.0
2007-08	5126.3	5037.0	89.3
2008-09	5444.3	5355.9	88.4
2009-10	5501.2	5412.1	97.3
2010-11 (Jul-Mar)	5558.7	5468.9	89.1
% inc./dec. over 2000-01	142.6	120.4	24.0

*E: Estimated*

*Source: National Transport Research Centre*

The pollution control policy in place focuses on industry-specific emission/effluent standards in terms of the best technology available offering no incentives to the industries to reduce pollution. It is recommended that a progressive tax rate should be levied on the quantity of pollutants recorded.

Before devolution the Ministry of Environment had taken to notice the heavy air pollution; to counter this predicament and improve air quality the Ministry developed Pakistan Clean Air Program (PCAP)<sup>95</sup>, approved by Pakistan Environmental Protection Council on 29<sup>th</sup> March 2010. The program now falls under Ministry of Climate Change. Major features of the PCAP include: exclusion of diesel-run vehicles from urban centers, establishment of Environmental Squad of Traffic Police in all major cities to control smoke, introduction of low-sulfur diesel and furnace oil and alternative fuels, encourage pollution-control devices and technologies in industries, relocation of brick kilns and adoption of alternative technology for brick manufacturing, establishment of Indoor Air Quality Standards, urban tree

<sup>95</sup> [http://www.environment.gov.pk/PRO\\_PDF/PositionPaper/PAKISTAN%20CLEAN%20AIR%20PROGRAMME.pdf](http://www.environment.gov.pk/PRO_PDF/PositionPaper/PAKISTAN%20CLEAN%20AIR%20PROGRAMME.pdf)

plantation, forestation in deserts and sand dune stabilization and focus on proper disposal of solid waste.

The relevancy and implementation of PCAP in peri-urban areas is however sketchy with foremost focus being urban centers primarily. PEPA has already begun work under PCAP: setting up seven continuous Air Quality Monitoring Stations and three Mobile Air Quality Monitoring Stations. These stations are at present on trial aimed to measure PM10 and PM25.

## CLIMATE CHANGE AND GLOBAL WARMING

Due to the rising riverbeds in the lower Indus Basin the vulnerability to flooding has risen considerably. Furthermore, the diversions and inadequate environmental processes have caused seawater intrusion and degradation of the Indus delta. In 2008, Green House Gases (GHG) reached 309 million tons (mt) of Carbon dioxide (CO<sub>2</sub>) containing 54% CO<sub>2</sub>, 36% Methane, 9% Nitrous Oxide and 1% other gases. The main culprit of these emissions is the energy sector with over 50% contributions as shown in the chart below. Pakistan contributes only 0.8% of GHG emissions globally; even though the country's per capita energy consumption and CO<sub>2</sub> emissions are low yet in CO<sub>2</sub> emissions per unit of GDP production are relatively high. Rising living standards in the country along with excessively high growth rate of population will increase demand for energy dramatically. Already facing an energy crisis Pakistan will have to use its thermal and coal potentials increasing its GHG emission levels consequently.

Also, Pakistan has low forest cover coupled with high rate of deforestation (0.2-0.4% per annum) so carbon sinks will degrade rapidly. In addition global warming also seems to have a visible impact on the survival, growth rate and health of forests. Climate change affects in Pakistan are evident: average annual temperature increased by 0.6%, precipitation increased on average by about 25%, increased variability of monsoon rains leading to vulnerability of extreme events (floods and droughts). Even though not appreciated enough, along with providing shade, trees offer many more environmental services: they diminish energy costs for cooling<sup>96</sup>, detain particulate and gaseous pollution<sup>97</sup>, store atmospheric carbon<sup>98</sup>, retain storm water in addition to recovery of water quality<sup>99</sup>, moderate erosion<sup>100</sup>, mitigate noise pollution<sup>101</sup> as well as raise property values.<sup>102</sup> Hence their worth in any region should be understood and valued. Fast urbanization in Lahore has led to chopping of trees further enhancing air pollution, increasing dust particles and adding to the rise in temperature.

These changes in temperature will bring about affects on land and water resources: dry land areas, arid and semi-arid areas are most at risk as these regions already face water shortages and high

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<sup>96</sup> Akbari and Taha, 1992

<sup>97</sup> Beckett et al., 1998, Nowak et al., 2000

<sup>98</sup> Nowak and Crane, 2002

<sup>99</sup> Seitz and Escobedo, 2008

<sup>100</sup> Wolman 1967

<sup>101</sup> Fang and Ling, 2003

<sup>102</sup> UFORE Model Analysis of the Structure and Function of the Urban Forest in Auburn, Alabama, *Ann Huyler\**, *Arthur H. Chappelka*, *Edward F. Loewenstein*, School of Forestry and Wildlife Sciences Auburn University

temperatures which become intolerable. These changes also distress the biophysical relationships of agriculture: disturbing growth periods of crops and scheduling of cropping seasons, increasing thermal and moisture crop stresses, altering irrigation requirements and soil characteristics, giving rise to pests and diseases ultimately having adverse affects on agricultural productivity.

The Hindukush-Karakoram ranges are also manipulated by climate change and global warming. The melting glaciers will bring about increased water flows to about 20% over a few decades at first and then due to depletion of glaciers river flows will fall back. It must be remembered that the Indus River System that supports the entire nation's water demands is supplied by the glaciers. Recent events of drought (from 1998-2001) and floods in 2003, 2006, 2010 and 2011 have enhanced poverty and proved the vulnerability of the country to climate change and its impacts. There is however also a risk of drought for areas far from the sea.

Due to urbanization Pakistan has lost much of its endemic fauna and flora. It is unfortunate to note that Pakistan among all countries of South Asia has the smallest selection of mammals, birds, amphibians and higher plants per representative unit of acre. As the country is not set out due to bio-geographical boundaries there are hardly any animals or plants unique to Pakistan. It has low proportions of endemic species; 7% flowering plants and reptiles, 3% mammals and 15% freshwater fish. Nonetheless, the fraction of "restricted range" species is quite high in the country; over four mammal species including, tiger, swamp, deer, lion and Indian one-horned rhinoceros, are reported 'disappeared' from Pakistan in the past 400 years. Pakistan must take into account the seriousness of the matter and protect its rich variety of cereal seeds from the threats posted by climate change.<sup>103</sup>

Regional cooperation will be required to tackle the challenge of climate change. The increase in water flows will provide an opportunity to increase water storage through more dams. It will be vital to initiate programs for increasing forested areas, education on climate change, enhancement of capacity in areas of climate forecasting and its impacts on socio-economic spheres.<sup>104</sup>

## CONCLUSION

Environmental issues relevant to peri-urban areas among many other include: visual untidiness, soil erosion, destruction of vegetation, siltation and depletion of water bodies and pollution of resources such as soil, air and water. Environment today is degenerating under pressures of rapid urbanization,

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<sup>103</sup> Country Environment Analysis, Asian Development Bank. December 2008

<sup>104</sup> Economic Survey 2011, Government of Pakistan.

inefficient and ineffective planning and development, weak land use rules and inadequate allocation of monetary support for maintenance of infrastructure. Industrial processes, tanneries, pulp and paper plants, mining and some agricultural activities in many developing countries are the most common sources of toxic effluents discharge and hazardous liquid waste directly into soil, air and water, causing contamination which is detrimental to human health.

Water issues spread over various possibilities with the element's complex properties many civil society representatives often plead that the resource should be perceived as a common good which should be free for all who need it still water is mostly managed through economic systems. The poor are in fact unable to satisfy daily livelihood needs of water in peri-urban areas, often the level of water they have access to is insufficient for basic human wellbeing and functioning. The use of water in peri-urban regions may weaken the functions of already in place water services; use of river resources can lead to changes in river flows and flood control mechanisms challenging the resilience of urban ecologies to flooding.

In peri-urban areas the matter of water needs to be approached through various dimensions: social, technological and ecological. Sanitation systems need to be sustainable in terms to provide value to the poor.<sup>105</sup> It is essential to understand the changing dynamic sphere of water issues; how water systems are changing with time within groundwater aquifers, surface water sources, village ponds and/or water outlets. The complexity surrounding peri-urban areas further complicates the understanding of hydrological and ecological processes since in these localities use of land and livelihood options vary in addition the industrial sector plays a pivotal role in determining the quality of water and introduction or change of technological interventions. The sundry occupancy of land and housing in peri-urban areas adds to the hurdles of access to water; making the matter informal and even illegal more frequently. Financial institutions are also hesitant to offer loans or services (of water fee collection) in these areas due to the rickety structure of ownership. Insecure tenure of housing is also the reason behind missing sustainable sanitation systems; it is difficult to install sewage lines in these densely built areas.<sup>106</sup>

Through globalization the world has opened to a bigger market introducing new industrial complexes; this has boosted technological innovations in factories and industries further polluting the fringes.<sup>107</sup>

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<sup>105</sup> Mehta et al 2007: 14

<sup>106</sup> On the edge of sustainability: perspectives on peri-urban dynamics, Fiona Marshall, Linda Waldman, Hayley MacGregor, Lyla Mehta and Pritpal Randhawa. Economic and Social Research Council. 2009

<sup>107</sup> Marshall et al 2003



Changing technologies are thought to facilitate development but they pose new threats to ways in which access to water is contested in peri-urban areas. For instance, it was recently witnessed in a peri-urban area that if a water treatment plant is set to provide clean water for residents and some irrigation the rise in water table can lead to new water borne diseases.<sup>108</sup> The issue is complex and interrelated as Mehta puts it “environmental, social, technological, and environmental aspects of water are intricately interwoven; each implicates and is implicated by the other”.<sup>109</sup> Moreover, climate change has brought further intricacies in the subject of water; availability, accessibility and planning.

Urbanization is spreading at a rapid rate pressing down on the available resources and infrastructure. Production and manufacturing processes in Pakistan are tarnishing valuable and scarce ecosystems. It may be said that economic growth of the country is being achieved through exploitation of the environment. Being an economy significantly dependent on natural resources environmental degradation will lead to a cycle of “ecological poverty” impairing the idea of sustainable economic growth.<sup>110</sup> Hence, there is an urgent need to build monitoring systems to assess the status of environmental damage in Pakistan. What we don’t realize is that action is required instantly to put a halt to these irreversible damages. Without any delay work needs to begin on all edges: prevention of air and water pollution, management of solid waste and protection of fragile ecosystems.

The areas of most concern as identified by the Government of Pakistan include water, energy, pollution and waste management, irrigated agriculture and biodiversity. The Government of Pakistan has developed many Acts to protect the environment but implementation of these rules is a matter of grave concern.<sup>111</sup> The authorities have set forth rules and regulations to ensure that growth in Pakistan is environment safe; all public sectors development programs are meant to go through the Initial Environment Examination and Environment Impact Assessment. The credibility of this assessment is questionable yet for a developing country to build these rules is also worth praise.

During field visits it was noted that housing settlements in these peri-urban areas were based on rural traditions (not on urban patterns). For instance there was no formal layout evident with no proper streets or provision of service. Since these areas are already constructed it is now difficult to inaugurate

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<sup>108</sup> Narain and Nischal 2007

<sup>109</sup> Mehta et al 2007: 16

<sup>110</sup> Country Environment Analysis, Asian Development Bank. December 2008

<sup>111</sup> Pakistan Urban Sector Strategy Study. June 2000. Government of Pakistan

conventional engineered sanitation systems. When calculated it can be found that the cost of setting up a new water system is less than extending an existing water line and sinking in new pipes with it.

The structure of governance in such areas also holds intricate and complex characteristics making it more plausible for these neighborhoods to be ignored and neglected.<sup>112</sup> Some researchers and academicians have posited water privatization to counter inefficient public water systems but it is more than evident that privatization in any form will neglect peri-urban areas where the poor and marginalized reside.<sup>113</sup> Private players are not missing from the scene of water supply in peri-urban areas but are not seen to dominate the situation. These private providers supply water through tankers, bottled water and by recycling waste water in urban regions. This private sector is further exploiting the groundwater sources which will lead to environmental hazards and negative externalities. The regulatory control over this private sector is sketchy hence their compliance to environmental standards and pro-poor motive is apprehensive.<sup>114</sup>

Pakistan has claimed to be committed to the (seventh) Millennium Development Goal (MDG) which has a target (7c) of halving the proportion of people without sustainable access to safe and improved sanitation by 2015. The provincial governments are the authorities in charge to provide strategic direction, capacity development and monitoring and evaluation along with financial support.<sup>115</sup> Yet little work can be seen on ground. Government initiatives include the National Standards for Drinking Water Quality (NSDWQ)<sup>116</sup> built by PEPA, approved on 29<sup>th</sup> March 2010, to improve water quality and provide safe drinking water. Academicians suggest rainwater harvesting, recycling and other alternative sources of water in proposals to achieve more equitable distribution and access.<sup>117</sup>

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<sup>112</sup> Solo et al 1993

<sup>113</sup> Allen et al 2006b

<sup>114</sup> On the edge of sustainability: perspectives on peri-urban dynamics, Fiona Marshall, Linda Waldman, Hayley MacGregor, Lyla Mehta and Pritpal Randhawa. Economic and Social Research Council. 2009

<sup>115</sup> Economic Survey, Government of Pakistan 2011

<sup>116</sup> <http://www.environment.gov.pk/act-rules/DWQStd-MAY2007.pdf>

<sup>117</sup> Mehta et al 2007: 3

## Chapter 4. Governance

### THE CONCEPT OF GOVERNANCE

The UNDP Governance Policy Paper defines governance as the management of national affairs of a country through a process that engages three sets of actors; those from the state who provide the enabling environment, those from the civil society who facilitate participation and social direction and those from the private sector who create jobs, income and services<sup>118</sup>; fostering of interaction through these processes between the three actors thus constitutes governance.

Governance is manifested in various spheres and at several levels involving different actors;

- At a systems level where governance is manifested through state institutions such as the Judiciary, the Legislature and the Executive.
- At sub-national and local levels through local governments setup such as Local Government structures in Pakistan introduced under the (Local Government Ordinance) LGO 2001.
- At sectorial levels through institutions related to issues such as environmental governance, educational and water and sanitation governance.
- And lastly, through different social and political groups for e.g. minorities and ethnic tribes which also extend to include the poor who are residents of peri-urban areas.

These manifestations translate into three geographical spatial generations when it comes to governance of settlements including governance of urbanization and urban expansion.

- The first of these is the rural perspective or dimension which evolves out of the rural characteristics related to first generation of spatial expansion. Six of these defined during the FAO World Conference on Agrarian Reform and Rural Development in 1979 related to; access to land for the farmer, access to water for the agricultural production, access to production inputs, farm to market roads, pricing of farm products and finally local organizations and institutions such as farmer's committee.

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<sup>118</sup> UNDP. "UNDP Governance Policy Paper.". N.p., Jan. 1997. Web. <<http://mirror.undp.org/magnet/policy/>>.

- Characteristics of second generation spatial development relate to expansion of urban areas. The issues arising out of this urban development relate to; financing and self-sufficiency of municipalities through tax collection, land management and land use regulations, environmental impacts of urban expansion, access to basic services and development of urban infrastructure.
- The third generation of spatial expansion refers to the new peri-urban perspective. This perspective was guided by two important developments. As population increased and spread over into the hinterlands of urban areas, it became clear that rate of urbanization could not match up to the rate of population increase. Therefore these hinterlands or peri-urban areas as they have come to be known emerged as a separate entity within the rural-urban transitions. The niche for these areas in policy-making was carved out when policymakers started to feature the quality of life into decisions about urban development. This meant that while the actual infrastructural and physical urban changes might take some time to develop, people living around the urban core could be facilitated into at least living the same quality of life as those living within the urban core. It was also suggested that this shift in policy would also ease the burden on already overworked urban municipal agencies.<sup>119</sup>

Governance in peri-urban areas is a relatively new concept but academics and practitioners agree on three basic guiding principles.<sup>120</sup>

- Thinking and acting strategically, which means that there has to be a balance between long term and short term policies. Rapid urbanization is not a loss-loss situation for peri-urban areas; these come with opportunities as well, such as new employment openings. Urban employment pays much higher than rural employment. It also means more land for low cost housing societies and better infrastructure.
- A participatory process needs to be established for developing these peri-urban areas as there is a myriad of actors involved with the process of urbanization while most of peri-urban areas in developing countries at present are 'institutional orphans'.
- Working incrementally has to be the third guiding principle as no change is going to come overnight.

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<sup>119</sup> SDPI. *Rural to Urban Transitions and the Peri-urban Interface*. Proc. of East West Centre Inception Workshop, Islamabad. 2011. Print.

<sup>120</sup> Ibid.

## THE EVOLUTION OF RURAL AND URBAN GOVERNANCE STRUCTURES

Pakistan is a federation of five provinces with every province having an elected provincial assembly; an elected parliament at the capital which constitutes of a lower and upper house. The lower house has seats allocation weighted according to population size of each province while the upper house has equal representation from all provinces. Union Council (UC) is the lowest administrative unit of the government holding on average population of 50,000 to 70,000.<sup>121</sup> Along with the Local Government Ordinance (LGO) 2001, the two most important pieces of legislations that helped shape the face of local governance in Pakistan are the Land Revenue Act for Pakistan 1967 and the 1979 Local Government Ordinance; these are discussed in brief detail here.

Land Revenue Act for Pakistan 1967 classifies land into categories based on its geography and land-use. Each category has its own tax ceiling also provided in the Land Revenue Act. In any given rural land settlement, that area where the built-up area was or where the population lived that was demarcated within 'Lal Lakeer' literally Red Line. Upon inspecting the land revenue maps, it is seen that around the populated area there is a red line in all the land revenue maps. In the past and up till now, within that the Red Line, the government does not pay any attention to collecting land revenue and has historically been not interested even in registering property titles. However, everything outside the red line i.e. the surrounding agricultural land was measured, mapped and there were ownership titles for everyone who owned the land and the owners had to pay whatever tax rate was decided for those particular properties. Over a period of time, with the population explosion, the rural community has boiled over from that red line into what was demarcated as the agricultural area. And along with this increase the need for electrification and other modern means of access to water; in most instances people have access to fresh ground water through private arrangements across Pakistan.

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<sup>121</sup> Hassan, Arif, and Mansoor Raza. "Migration, Small Towns and Social Transformations in Pakistan." *Migration, Small Towns and Social Transformations in Pakistan*. SAGE, 12 Mar. 2009. Web. <<http://eau.sagepub.com/content/22/1/33.abstract>>.

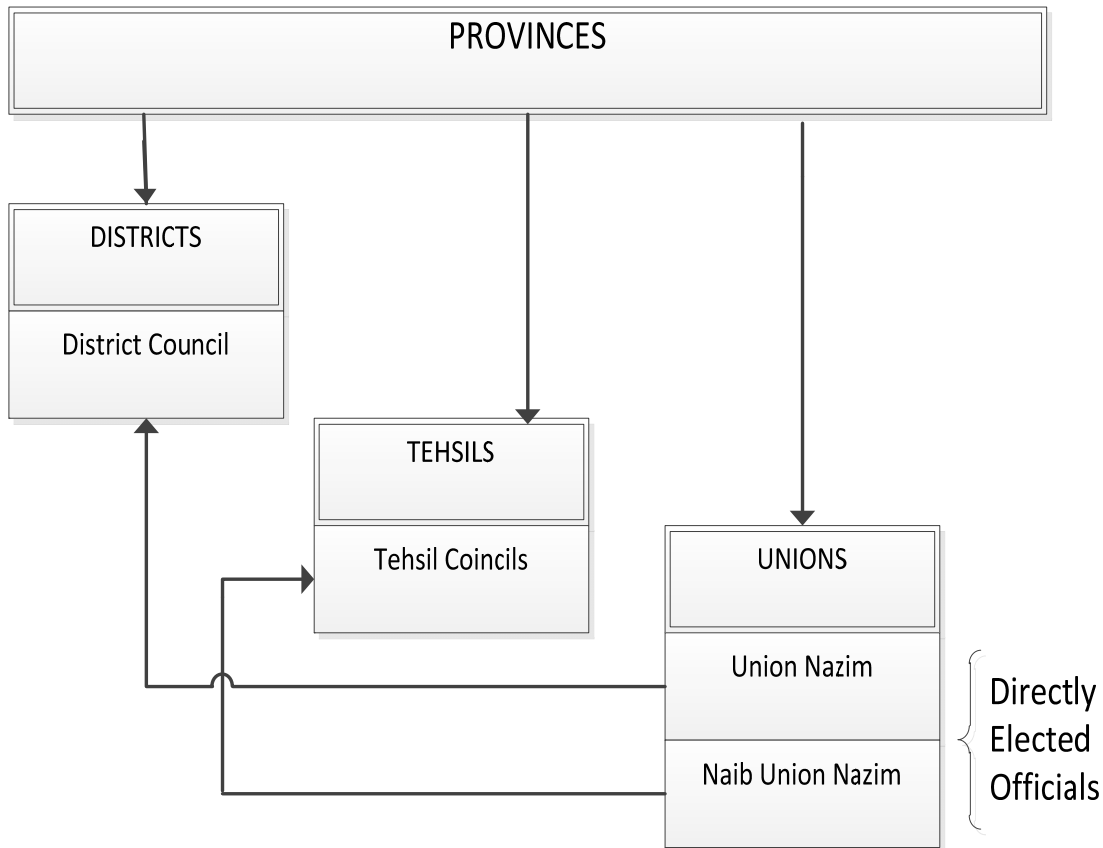
Rural and Urban places were defined in the 1979 Local Government Ordinance and these definitions were also used in the last census in 1998. In this ordinance, those areas that had a population of equal to or more than 5,000 had to be declared as first level urbanized by law and were supposed to be brought under the administrative setup of a Town Committee. After being declared a town committee, certain changes took place in the administration setup; a land use control authority would be established, building codes and by-laws would be employed, and most importantly, the town had to pay urban immovable property tax. This is different from the previous local rural tax rate being paid under the local governance and land revenue act.

It was under the Local Government Ordinance (LGO) 2001 when each of the then four provinces in the Pakistan was divided into zilas/districts, which were further divided into rural and urban tehsils/sub-divisions. These sub-divisions are constituted of Union Councils (UCs). The LGO did not discriminate between rural and urban setting, and these structures are the same in both localities.<sup>122</sup> Councils at each tier of the governance structure that was implemented via LGO 2001 are shown below; each of these is headed by the District, Tehsil and Union Council Nazim respectively.

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<sup>122</sup> Hassan, Arif, and Mansoor Raza. "Migration, Small Towns and Social Transformations in Pakistan." *Migration, Small Towns and Social Transformations in Pakistan*. SAGE, 12 Mar. 2009. Web. <<http://eau.sagepub.com/content/22/1/33.abstract>>.

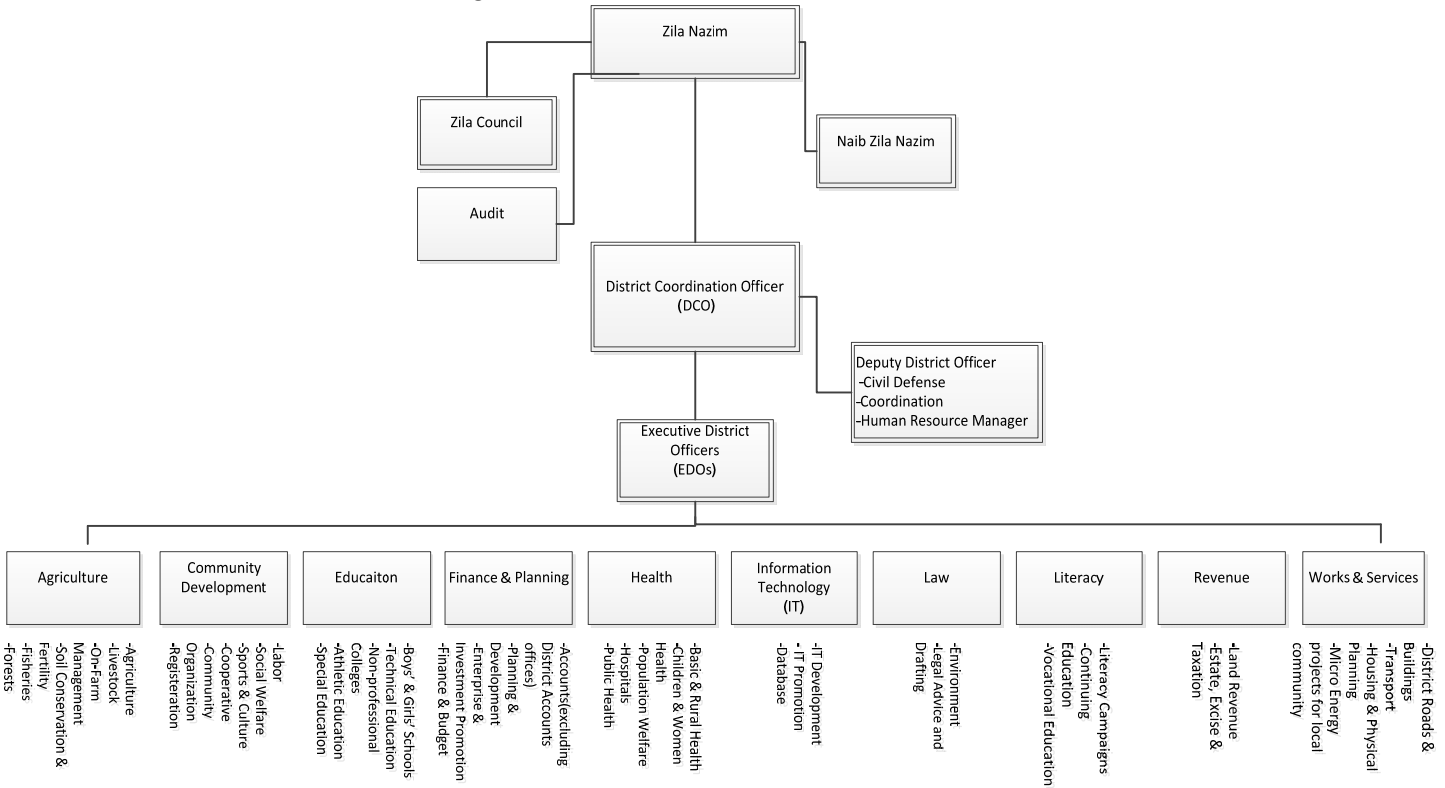
Figure 19 2001 LGO Administrative Structure<sup>123</sup>



An important deviation under the LGO 2001 from previous arrangements was that the entire district administration was now going to be headed by an elected official i.e. Zila Nazim, instead of a Federal Civil Servant whose new designation as the District Coordination Officer meant that the latter was only supposed to assist the elected officials. Functions of each office are shown in the chart ahead.

<sup>123</sup> "NRB: Local Government." *NRB: Local Government*. 2000 Web. <[http://www.nrb.gov.pk/local\\_government/default.asp](http://www.nrb.gov.pk/local_government/default.asp)>.

**Figure 20 Functions of Offices of District Govt. LGO 2001<sup>124</sup>**



Lahore as a case study for this National Status Report presents an interesting scenario of the issues that are most common to rural-urban transitions and peri-urbanization in South Asia. At present, following agencies are responsible for controlling the physical development of Lahore;

1. Lahore Development Authority (LDA) responsible for approximately 30% of area,
2. Nine Town Municipal Administrations (TMAs) responsible for approximately 60% of the area. These towns are Iqbal Town, Nishtar Town, Gulberg Town, Smanabad Town, Data Gunj Banksh Town, Ravi Town, Shalimar Town, Aziz Bhatti Town and Wagha Town.
3. Housing and Physical Planning Department for Rivaz Garden Housing Society
4. Defence Housing Authority for approximately 9%
5. Cantonment Board
6. Model Town Housing Society for Model Town, Lahore.

<sup>124</sup> Ibid.



The DCOs are currently responsible for heading the TMAs as local body elections have not been held after the elections of 2008 in Punjab. Both agricultural and urban area is being looked after by TMAs. Out of 2300 sq km of Lahore city, LDA looks after only 500 sq km right now.<sup>125</sup> The implementation of LDA master plan in all of Lahore is the responsibility of all these organizations and this creates a mismatch between policy and practice. LDA has proposed that it should be the sole authority that should look after the development needs of the entire Lahore city. LDA consists of three major wings: Urban Development Wing (U.D.Wing), Water and Sanitation Agency (WASA) and Traffic Engineering & Planning Agency (TEPA). LDA acquires funds through sale of government property, through government grants and through a portion of excise and tax duty collected by other government agencies. Water and Sanitation Authority (WASA) of LDA is responsible for water and sanitation of the Lahore district but due to lack of capacity and funds, they are only covering 450 sq km of the 550 sq km LDA is controlling. As a general trend, most urban areas have about 40-50% of the land available to them as residential but since the jurisdiction of LMA extends well beyond the urbanized areas, the residential area is less than 14% of the total.

**Table 14 Land Use under LDA Master Plan 2021<sup>126</sup>**

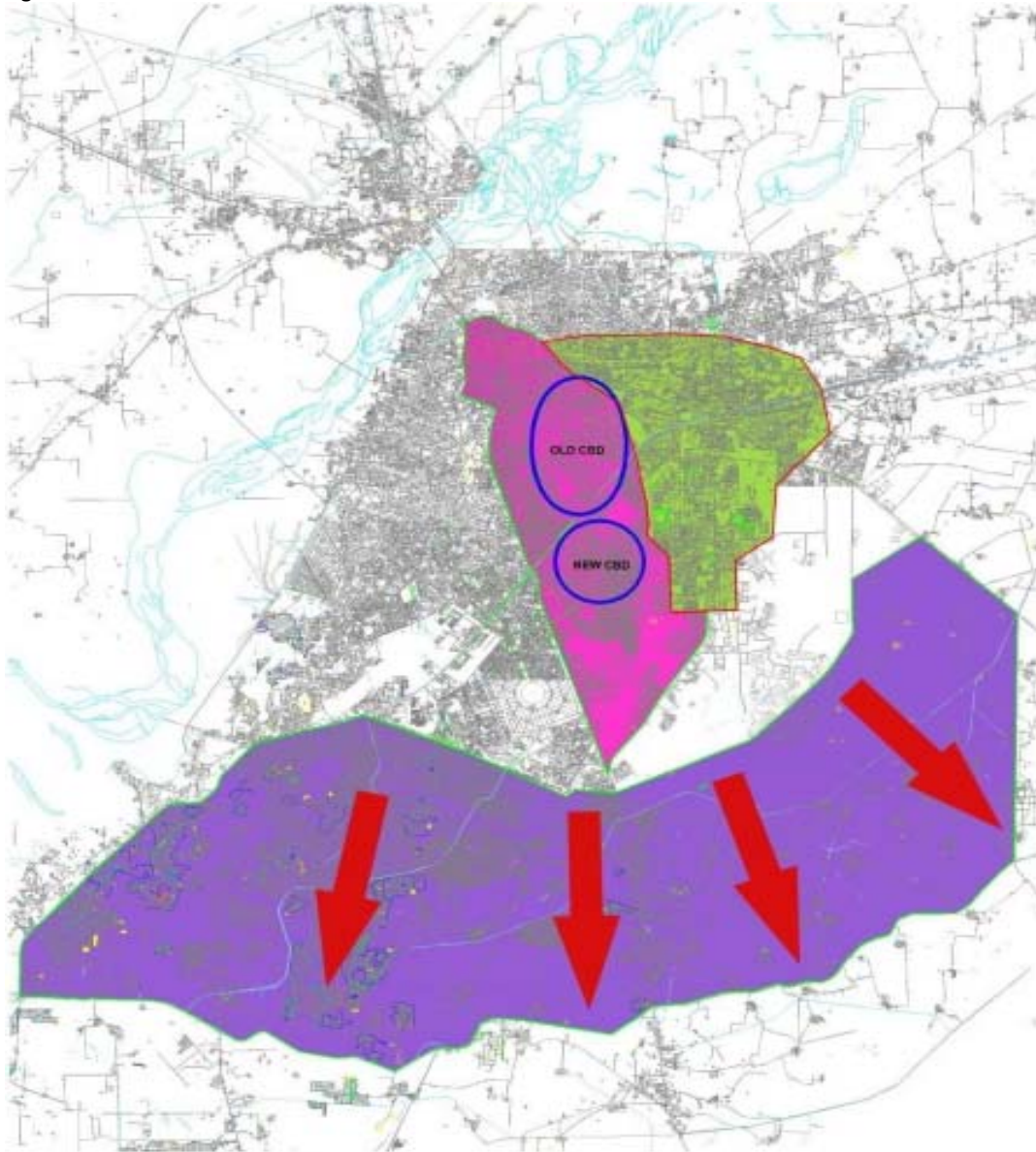
S. No.	Land Use	AREA (Sq Km)	% of land
1	Residential	314.6	13.64
2	Commercial	18.7	0.81
3	Educational	15.2	0.66
4	Institutional	10.2	0.44
5	Parks + Recreational	30.77	1.33
6	Industrial	151.05	6.55
7	Graveyards	6.6	0.29
8	Transportation	31.5	1.37
9	Vacant & Agricultural	1532.1	66.42
10	Villages	38.2	1.66
11	Water Bodies	57.11	2.47
12	Cantonment	100.67	4.36
<b>Total</b>		<b>2306.7</b>	<b>100.00</b>

<sup>125</sup> SDPI. *Rural to Urban Transitions and the Peri-urban Interface*. Proc. of East West Centre Inception Workshop, Islamabad. 2011. Print.

<sup>126</sup> NESPAK. *Lahore City Boundary*. Rep. Lahore: Urban Unit, P & D Dept, 2009. Print.

The old Central Business Districts (CBD) including Mall Road, Anarkali, Davis/Egerton Road in Lahore have been overrun by congestion of activities and the LDA has defined Gulberg Main Boulevard, Jail Road and M. M. Alam Road as the new Central Business Districts which indicates that the authorities are pushing commercial, trade and business activities towards the South as indicated in the Integrated Master Plan 2021. This trend is shown in the map below:

Figure 21: Old and New CBD of Lahore<sup>127</sup>



Health services in Lahore were looked after by the Provincial Government prior to the devolution plan. Each district in Punjab is now supposed to implement and design its own health plan. Therefore districts

<sup>127</sup> Ibid.

in Punjab have been preparing the three year rolling program and are being guided in the process by the Department of Health, Government of Punjab. Technical assistance has been provided for this program by the Punjab Devolved Program Social Services Program (PDSSP). 2010-2013 Rolling Plan is the first of its kind in Lahore and it is a comprehensive effort which delineates the activities, physical and fiscal targets for 2010 and provides targets for each year till 2013. A major improvement from the previous years has been that this plan also includes provision for monitoring and evaluation.

The National Environmental Quality Standards (NEQS) promulgated in August 1993 specify the standards which deal with; Maximum allowable concentration of pollutants in gaseous emissions from industrial sources, Maximum allowable concentration of pollutants in municipal and industrial effluents discharged to inland waters, sewage treatment and sea (three separate set of numbers), Maximum allowable emissions from motor vehicles, Ambient air quality standards, Drinking water standards and Noise standards.<sup>128</sup>

Pakistan Environment Protection Act (PEPA) 1997 sets out roles for the Federal and Provincial government. The Act provides laws against discharges and emissions, to repair damage and to impose fines. The document is by all means a useful and well-drafted document but matter of concern is implementation of the Act. Due to lack of funds and competence PEPA cannot efficiently put into practice demands and regulations of the Act at the district level. It is however criticized that environmental standards set out are not appropriate in the present climate and it will be beneficial if realistic lower standards with time-bound improvements are validated.

In accordance to the National Environment Action Plan (NEAP) objectives a Mid-term Development Framework 2005-10 (MTDF 2005-10) was constructed on the basis of Pakistan's previous experience with such initiatives. This document sets out actions in four fundamental areas of clean air, clean water, solid waste management and ecosystem protection. Under the 18th Amendment Ministry of Environment was devolved, it was then placed under the Ministry of Disaster Management and more recently it has come under the Ministry of Climate Change. The main aim of the devolution was to empower the provincial department who are in fact responsible for implementation. However, no new policies have yet been developed. Provincial Environment Protection Departments (EPDs) have also not given a clear mechanism through which they can ensure that the country's environmental laws are

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<sup>128</sup> The Urban Unit, *Environmental and Social Management Framework for Punjab Cities Governance Improvement Project*, Draft. Available at: <<http://urbanunit.gov.pk/PCGIP.asp>>

followed. This was expressed by the Secretary Environment Punjab, Saeed Iqbal Wahlah during an interview in May 2012, *‘There is virtually no mechanism which empowers the department to take plausible action against violations, how can we expect to fight this battle with no arsenal in our bag?’*<sup>129</sup>

This tale of events shows that devolution of powers to district level vis-à-vis environmental governance is still a dream.

The two authorities working under Lahore Development Authority responsible for water, sanitation and waste disposal between them are the Water and Sanitation Agency (WASA) and Lahore Waste Management Company (LWMC). Their institutional structures are given in figures below. The Lahore Parks and Horticulture Authority (PHA) is responsible for maintenance of green belts and parks.

Figure 22 Institutional Structure of WASA<sup>130</sup>

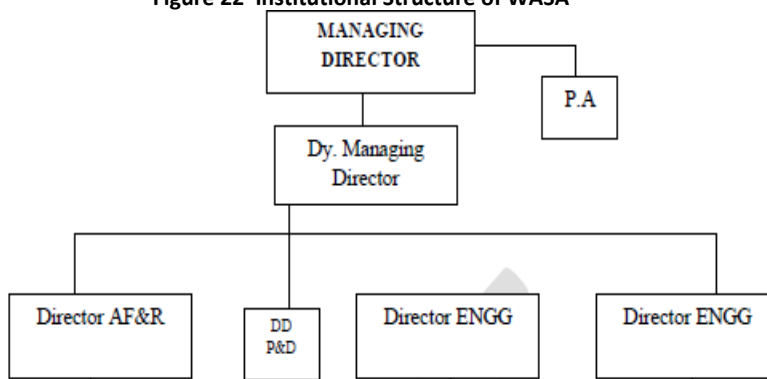
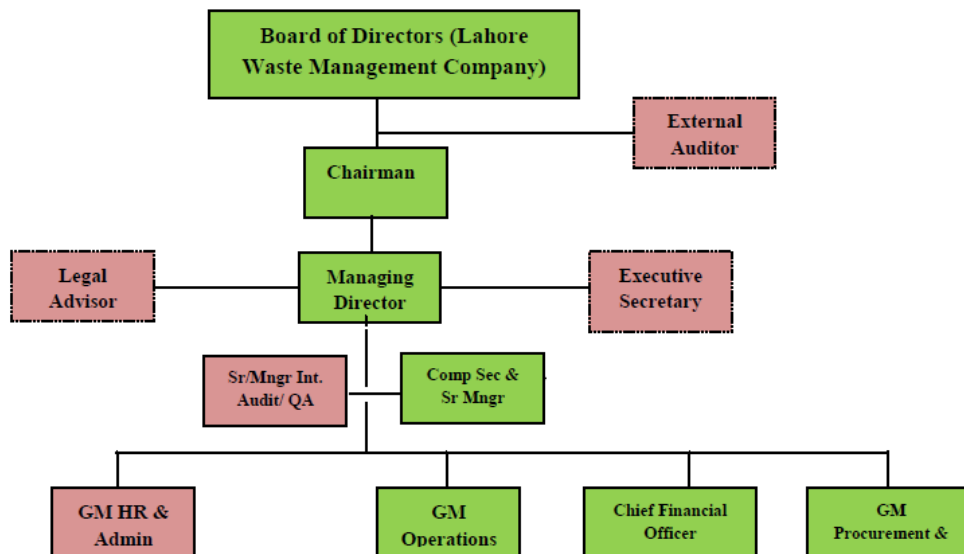


Figure 23 Institutional Structure of LWMC<sup>131</sup>



<sup>129</sup> Punjab EPD a toothless department, *The News*, May 29, 2012. Print.

<sup>130</sup> Ibid. Af&R stands for Administration, Finance and Revenue while P&D denotes Planning & Development, ENGG represents engineering.

<sup>131</sup> Ibid.

## CONSEQUENCES/IMPACTS OF GOVERNANCE STRUCTURES AND POLICY RESPONSES AND EMERGING ISSUES

The reason why governance of peri-urban areas is important is that we see institutional fragmentation in such areas while urbanization is in process. In these areas there is a convergence of sector based governance issues, as there is a proliferation of different agencies looking after these peri-urban areas which overlap in spatial and physical dimensions.<sup>132</sup>

Take for example a city in Pakistan; at once you have the local government, the departments of the central government, departments of the state government, various enterprises such as LDA, the NGOs, targeted programs funded by the donors with their special development units and consumer groups associations. So we have this proliferation of institutions providing a set of services which is the issue in every city. When we go to peri-urban areas, this issue becomes more complex.

Governance is sometimes complex in peri-urban areas because these areas often share the territories of more than one unit. Part of it might be in the rural district and the other part may belong to the city jurisdiction. Such an example exists in the case of Lahore where the population of Ferozwala precinct spreads into both the jurisdiction of the Lahore City District Government and Shiekhupura District. The third reason is that there are limited municipal service providers with sectors such as transport, water, energy, waste management and land use planning. Again, in the case of Lahore, it was revealed to the SDPI team by the Lahore Development Authority (LDA) officials that Water and Sanitation Agency (WASA) a division of LDA has the mandate to cover all of Lahore but only covers around 10 percent of water facilities in the district. The rest of the areas especially peri-urban areas rely on private arrangements of water supply and sanitation. Because of low capacity of the municipalities in these areas, what happens is that peri-urban areas 'fall through the crack' of these fragmented mechanisms of governance.<sup>133</sup>

Imagine a city where 8 or 9 different agencies are providing services without coordination with one another then there springs up peri-urban areas and none of the agencies cater to people living in these areas because of lack in coordination. A solution to this requires a conceptual shift from physical definition of urban and rural areas to a broader understanding of how the complex patterns of settlements and resource use, capital goods and services do not fit into formal jurisdictions as upon

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<sup>132</sup> SDPI. *Rural to Urban Transitions and the Peri-urban Interface*. Proc. of East West Centre Inception Workshop, Islamabad. 2011. Print.

<sup>133</sup> Ibid.

examining the interface between urban and peri-urban, the definitive differences appear in these sectors.

Another aspect of urbanization that is missed out in policymaking in Pakistan is the psychological aspect of the process which directly contributes to the mindset of a population. As mediums of communication bring the world closer, more and more people residing in rural areas want to adopt the urban lifestyle and enjoy the same level of facilities that are available to urban residents.

Peri-urban areas are unique with their own set of problems and are a result of rapid urbanization. Some of the governance questions that can be looked at w.r.t the governance of peri-urban areas in South Asia are;

- Under what jurisdictions do these peri-urban areas create i.e. what are the institutional structures and the agencies that are involved?
- What are the governance mechanisms for citizen's engagement in the service delivery decision making process?
- What are the multi-agency consultation mechanisms for peri-urban areas?
- What tools are being used for accountability of local administration/local government especially with regards to peri-urban areas? [Brazil, Bangladesh and India are leading way in introducing accountability mechanisms by using participatory budgeting, social audits, formal campaigns through media, access to information]
- How are the residents of the peri-urban areas organized in local organizations? [Greater the organization, greater the access to service delivery] To what extent are planning and budgeting processes and decisions integrated?<sup>134</sup>

The district councils under the LGO 2001 were ill-equipped in terms of capacity, manpower and even the legal structure in place they did not have the ability to regulate land use controls, building laws and codes. And so while the organic population growth was taking place, it was not regularized and the development that came about because of this growth was haphazard and unplanned at best. Since there was no legal structure that covered the new built up areas, there was an immense increase in the conflicts arising out of such development, and these cases were not referred to anyone except for the 'Patwari' and local police SHO and thus these cases ended up being registered in the court as criminal cases instead of property cases.<sup>135</sup>

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<sup>134</sup> Ibid.

<sup>135</sup> Sr. Transport Specialist, Urban Unit. Bukhari, Syed M.A. "Lahore Peri-Urbanization." Personal interview. 30 Apr. 2012.

Even the census used to identify areas which could be declared as first-level-urbanized was not carried out for an extended period of time due to a myriad of reasons. [1981 to 1998 gap] Many areas went up to a population of 20,000 people and had still not been declared urban. And because of political manipulation many areas which had a population of less than 5,000 were declared urban in order to get certain benefits and government funds. This also related fundamentally to the taxation structures because in the rural areas one of the very important taxes that was levied in order to provide municipal services was known as the export tax, while the urban areas were charging what was known as Oktwa Tax. Any produce that was exported out of the rural area was taxed by the district council. Whereas in the urban areas, items coming in were taxed and there was a list and schedule determining both of these.<sup>136</sup>

When a rural district council is made into a town committee there are certain changes that need to be brought about which cost a lot of money including, a town hall which has to be built, new staff has to be hired, there is a schedule of establishment, inspectors, cleaning and water staff which needs to be hired so there is a whole list of expenditures that have to be undertaken. And since local tax collection is not the forte of Pakistan, this meant a lot of burden on the Consolidated Provincial Fund. Therefore there was much reluctance to convert expanding rural areas to urban areas by the government. The provincial P&D department, finance dept. and the lines dept. wanted to keep the control of finances to themselves and thus avoided demarcating the expanding populations as urban<sup>137</sup>.

The ribbons along the highways also present another phenomenon when it comes to unplanned growth. The road networks are usually laid out in areas by the road inspectors from where they expect returns and this practice constitutes as corruption. The money paid out by different shop owners, petrol pump owners along the highway road goes up the chain of government officials. NRB was given the task to organize this failing system of governance. The problem's solution as devised by the bureaucracy however was to simply add another zero to the 5,000 limit! Upon analyzing the population settlements in Punjab, NRB realized that if demarcation of the populations of more than 5,000 as urban and undertook their expenditure, the provincial budget for the next thirty years would be engulfed, and every year the number of these settlements will keep on increasing<sup>138</sup>.

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<sup>136</sup> SDPI. *Rural to Urban Transitions and the Peri-urban Interface*. Proc. of East West Centre Inception Workshop, Islamabad. 2011. Print

<sup>137</sup> Ibid.

<sup>138</sup> Ibid.

As a response, Tehsil Municipal Administrations (TMA) were created by National Reconstruction Bureau (NRB) under the LGO 2011 and it was declared that the entire area under a TMA will be demarcated for the purposes of land use control, zoning, building laws and by-laws, urban immovable property tax and it merged the urban and rural under the same legal structural framework, and brought them under a regulatory control for the first time. TMA chief officers and their regulatory mechanisms including town planners and all other kinds of functionaries i.e. inspectors etc. could now be mobilized to what oversee had hitherto been rural areas but had now undergone organic growth. So in this way, the TMA was given the mandate to use both rural and urban areas under its jurisdiction to streamline the previously unplanned growth in next ten to twenty years through different taxes such as the immovable urban property tax.

In this way, NRB also limited rural to urban resource transfer which was biased in the favor of urban areas. Local funds would be consolidated under a single fund with the TMA and development of the entire area would have to be planned accordingly. NRB knew that there was going to be an initial financial shock but under the Provincial Finance Commission Award, TMAs would also be given the funds for PH & D dept. for its respective area and through that mechanism, the Provincial Finance Commission would radically raise the funds which was to be given to the TMA from the Provincial Consolidated Fund. And through the combination of these items including the various councils a municipal revolution was to be created.

However, this exact result did not come forward and the main reason that this did not happen was that the elite bureaucracy decided to not opt in to this process. Previously, at the TMA level, all Town Committees were being looked after by the Assistant Commissioner (AC) who was the kingpin of it all and all the patwaris were also under him because he also served the revenue collector for both urban and rural areas. With the new LGO 2001, that office of AC became Deputy District Officer (Revenue) and the administrative and political functions of the Town Committee were given to the TMA council. The AC's function was limited to just revenue collection. As the AC was mostly a federal officer, from DMG group and the TMA officials were employees of the local council, this arrangement was seen as rudimentary and alien by the elite DMG officials<sup>139</sup>.

According to the financial institutional arrangement funds for the TMA had to come from the consolidated provincial fund. This meant that the provincial civil service was going to be involved and

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<sup>139</sup> Ibid.



some of the funds were also directed to the district level while the planning structure had been devolved to the Tehsil level. So while the TMA wanted to provide the municipal services, the district govt. elbowed in because they had the funds and used their own line depts. to work on these projects. This caused huge multiplicity in terms of governance planning.

The urban immovable property taxes by practice are to be collected by the Excise and Taxation dept. of the provincial govt. and not the land revenue dept. These collections are then given back to the areas they are collected from and the Excise and Taxation dept. charges a 15% fee for this arrangement. When the collection of urban immovable property taxes was handed down to the TMAs, each TMA decide to develop its own formula for the collection and regulation of urban immovable property taxes. Many of the TMAs had the political will in their constituency to redefine the tax ceilings. Exercise and Taxation dept. however had its own agenda going on the side. Statistically, for every 100 PKR of fine/tax collected, the collection efficiency is only worthh 50 PKR or 50%. However, the collected amount is much more than the deposited 50 PKR which points towards the rampant corruption that is prevalent when it comes to tax collection<sup>140</sup>.

The Excise & Taxation dept. wanted to collect the urban immovable property tax, and proclaimed that the TMAs of some areas had misappropriated the taxes and the tax ceilings. After this incident the provincial government decided that no TMA will be allowed to vary the urban immovable property taxes because of which these TMAs lost out on a major fund raising activity. According to a recent news report, *'the auditor general's (AG) office has prepared 472 reports containing 17,454 audit para which point out financial irregularities involving Rs149 billion in district government and Rs21 billion in tehsil municipal administrations (TMAs) and union councils.'*<sup>141</sup>

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<sup>140</sup> Ibid.

<sup>141</sup><http://tribune.com.pk/story/381019/taking-action-eight-years-of-local-government-corruption-lie-stowed-away/>

## CONCLUSION

Urbanization is going to have a huge impact on the politics in Pakistan because whenever and wherever you go to the people and ask them what they need, they will ask for municipal services, and this phenomenon is known in the political circle as 'gali-nali'<sup>142</sup>. And all elected politicians are dealing with these issues all day while they do not have the structural backing to address these issues. This means that the structures that we have discussed so far have been unable to perform their core duties of providing basic services to the expanding population.

There is a lot of tension involved in creating a sturdy system for provision of municipal services because any such system will have to be local meaning that the role of provincial and federal governments will have to be taken out of the equation and limited. Therefore many influential political names do not want to be part of a local government (as they see it to be below themselves, having spent majority of their political careers in the provincial and federal legislature) and want to keep the control of districts at the provincial/federal level. This is a huge factor which prevents the local governments from proceeding forward in any meaningful manner.

Peri-urban governance in Pakistan as also seen through the case study of Lahore is a relatively new concept. It was only in 2009, when the word peri-urban made its way into the government policies. However, the Govt. of Punjab is committed to drawing up well-structured plans for its urban cities. But as we have seen, governance mechanisms and instructional framework lack expertise and technical capacity to carry out the plans to the letter. Since Local Government is now a provincial subject after the passage of the 18<sup>th</sup> Amendment, the possibilities for every province to devise their own formula of governance has increased. Which means that a strong political resolute to create an effective system for governance in peri-urban areas will go a long way in achieving the desired effects of urbanization across the province.

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<sup>142</sup> SDPI. *Rural to Urban Transitions and the Peri-urban Interface*. Proc. of East West Centre Inception Workshop, Islamabad. 2011. Print.

## Chapter 5: Conclusion

The challenges presented by peri-urban areas, whether related to governance, health, environment, water & sanitation or basic services delivery as a whole are complex, multidimensional and unique. These challenges require that all hurdles to the provision of basic services, infrastructural development and environmental protection be confronted head on; including, but not limited to, the recommendations provided in this report.

In the first chapter after giving providing various definitions of how different scholars, scientists, researchers and urban experts are defining the “peri-urban” interface a definition for the purpose of this study was put forward. After thorough literature review, interviews with important stakeholders and visits of peri-urban lands the definition was based on the characteristics of a peri-urban area such as: size of population, population density, access to infrastructure, time and cost of accessing larger urban areas, type of houses, land use, availability of education, availability of health facilities, sources of water supply, source of income (employment pattern), source of finance in development and tenure regularity and permanency.

The second chapter begins with the history of Lahore and provides an overview of Lahore’s haphazard and unplanned urban expansion over the years. Most of the urban development initiatives in Lahore took place during the British and Post Partition period. This expansion further increased during fifties and sixties with newly initiated Lahore Improvement Trust that did not only cause expansion of the city’s footprint, but also reshuffled and redistributed land uses and socio-economic characteristics. The chapter relates how in the early Mughal period economic activity and lavish lifestyles led to the initial spread of the city. The British Raj brought with it more systematic growth of the city dividing it into particular sections; residential, commercial, recreational. In addition to the development works, regulatory and service provision mechanism was also developed during British period through formulation of new Municipal Act in 1911, a Lahore Electric Supply Company in 1912 and establishment of Lahore Improvement Trust (LIT). The partition in 1947 caused major turmoil in the subcontinent and the case of Lahore was no different with numerous people migrating both in and out of the city. With the years came an increase in population leading to an increase in institutions and activity escalating the expansion of the city hastily.

The next chapter discussed that even today Pakistan falters in most of its targets for basic health and environment related millennium development goals. This is evident through lag in indicators such as: under-five mortality rate, proportion of fully immunized children between the age of 12 to 23 months, maternal mortality ratio, proportion of births attended by skilled birth attendants, contraceptive prevalence rate, total fertility rate, proportion of women (15-49 years) who had given birth during last three years and made at least one antenatal care consultation, proportion of population in malaria risk area using effective malaria prevention and treatment measures, incidence of tuberculosis per 100,000

population, forest cover including state owned and private forest and farmlands, sulphur content in high speed diesel, proportion of population with sustainable access to a safe improved water source and proportion of population with access to sanitation.

In the sub-section of chapter 3 the current status of Pakistan's health system has been found to be characterized by many problems including: structural fragmentation, gender insensitivity, resource scarcity, inefficiency and lack of functional specificity, accessibility (availability and affordability), unawareness and high population growth rate. The most common disease in the country is acute respiratory infections followed by malaria and diarrhea. Health experts confirmed that the common source for most diseases is heavy pollution in the country hence the health status of areas where pollution is more is worse these include the peri-urban areas of Lahore. The active role of informal medical dispensaries and spiritual healers, in peri-urban areas of Lahore, has also been under discussion in the next sub-section along with an overview of other options of healthcare available.

Water issues spread over diverse horizons a sub-section of chapter 3 aims to touch upon the most relevant areas of water issue for peri-urban areas such as waterborne diseases, sources of water supply, drinking water availability and accessibility and sanitation facilities. It was found that no service of providing water and sanitation facilities was available in most of the peri-urban areas visited. Most initiatives were taken up privately by households or by the community. The next sub-section provides that about 48000 tons of garbage is thrown out on the streets every day; the lack of proper solid waste disposal mechanism is polluting the groundwater or/and the air. Major industries including: chemicals, pesticides, textiles, pharmaceuticals, cement, electrical & electronic equipment, glass & ceramics, pulp & paperboard, leather tanning, food processing and petroleum refining are contaminating the main drains of Lahore further exposing the residents of peri-urban areas to a variety of liquid waste risks in the form of effluents, GW contamination and water pollution. The highest level of industrial waste among 21 cities of Punjab is that of Lahore; 28.9% of the total.

Chapter 3 continues to analyze the two-way relationship of agriculture and pollution. Air and noise pollution status is also briefly noted; most peri-urban households use biomass as fuel due to lack of or no access to modern energy services causing indoor air pollution. It has been recorded that 86% of rural households are using biomass fuels for cooking this practice may lead to acute respiratory infections. Climate change is a global challenge and the peri-urban areas are most vulnerable to these changes: these are poor neighborhoods unable to adapt or mitigate these abrupt changes, most of the households are agriculture-based, most household structures are "katcha", the literacy rate of such areas is low and hence awareness is low.

The first section of chapter 4 works to explain what governance is and its role, what structure is found in Pakistan. The chapter concludes that the existing structure fails perform its core duties of providing basic services to the expanding population. There are many reasons for this failure including: many influential political names do not want to be part of a local government, governance mechanisms and instructional framework lack expertise and technical capacity to implement the well-written plans and policies, peri-urban areas are usually neglected by both urban and rural jurisdictions.

## Chapter 6: Way Forward & Recommendations

In light of the findings of the research, a number of recommendations can be drawn to improve the overall environmental, health, governance, basic service delivery and water & sanitation conditions of peri-urban areas:

- **Ensuring adequate land policies and official control procedures are in place to de-necessitate formal land or housing tenure for access to basic services and infrastructure development**

Since peri-urban areas mostly grow outside the formal jurisdictions of the municipal authorities of cities, they are commonly off-limits to formal network infrastructure facilities that are provided to the metropolitan core. Apart from budgetary constraints, part of the underlying rationale behind this non-provision of services to peri-urban areas is to discourage the impression that the government administration has formally accepted these settlements, which in most cases happen to be illegally constructed on government owned lands.

On the other hand, if suitable land policies and effective control procedures exist that clearly outline and define the status of land ownership, the residents of peri-urban areas can be provided basic services like water and sanitation without the need for formal land or housing tenure.

- **Decentralized approach to basic service provision involving greater user involvement and non-governmental, community-based and private organizations**

Owing to the greater distance from formal municipal services in urban areas, lower population densities causing the inability to achieve economies of scale, and legal barriers in peri-urban areas, *centralized* solutions to education, health, waste management and water and sanitation services need heavy capital investments which are unaffordable by the poor. This means that decision-makers should put in a greater focus on *decentralized* systems of basic service provision involving greater user involvement for the enhanced provision of basic services in peri-urban areas. Community-based, not-for-profit organizations and NGO's, as well as small-scale commercial firms could be used to develop affordable, sustainable and adequate decentralized solutions for basic service provision in peri-urban areas. Many experts suggested that a public-private partnership is the best way to bring about facilities in the peri-urban areas of Lahore.

- **Enhanced understanding of the impact of both spatial and non-spatial policies on peri-urban areas**

Better knowledge and understanding of the impact of both spatial (e.g. provisions for parks and green belts around metropolitan areas) and non-spatial policies (e.g. industrial or agricultural subsidies) is needed to devise adequate and effective frameworks for interventions in peri-urban areas.

- **Wider integrated water management interventions and decentralized wastewater management techniques adapting to and benefitting from unique problems and opportunities**

The municipal jurisdictions and institutional arrangements with regards to service delivery usually focus too much on 'purely urban' or 'purely rural' areas to be able to provide an integrated framework for services delivery causing peri-urban areas to 'fall through the cracks' of inadequate governance mechanisms. Decentralized measures that make use of small-scale commercial or not-for-profit community based organizations and service providers can prove to be more beneficial and affordable. Based on the specific conditions of a given area, unique opportunities can be used to the advantage of the area, for example, using wastewater from industrial processes in the urban core in the cooling systems in peri-urban industries, or using the waste water for peri-urban agriculture after necessary treatment.

- **Need for project planners to not operate unilaterally, but instead encourage the involvement of all relevant entities including community representatives**

Decision-makers and project planners should take on board legal specialists, urban planners, social scientists, financial analysts, and a wide range of institutions such as the water and power development authority, the Ministry of Health, water and sanitation authority and urban development authorities, as well as representatives of community members of peri-urban areas and use the accumulated inputs, knowledge and recommendations of all these entities in formulating and implementing interventions to address development in an inclusive, multi-dimensional and thorough manner. Some government officials also advised that community based institutions should be established to hear the voice of those in the rural or peri-urban areas this will eliminate the communication gap in the process of decision making.

- **Intensive educational initiatives for occupational activities as well as health education, waste disposal, sanitation and hygiene practices, and awareness-raising on similar issues of concern**

A large proportion of the residents of peri-urban areas were found to be unaware of even the most basic health and hygiene practices like the boiling of water before use, covering food utensils, or thorough hand-washing after using the toilet and before having meals. Awareness measures, including but not limited to the means of carrying out and the importance of health education; including simple means of avoiding common infectious diseases and ailments, hygiene, sanitation and waste disposal etc. Intensive educational initiatives for occupational activities as well as health education, waste disposal, sanitation and hygiene practices, and awareness-raising on other important issues should also be set up.

Education and awareness related to health and safety measures and in occupational activities like farming and milk-production and investment in better infrastructure facilities like transportation will also go a long way in improving the quality of products, livelihoods and incomes of the residents of peri-urban areas.

- **Strengthening partnerships with regional and other developing and developed nations with regards to peri-urban planning and development**

Developing stronger linkages through the sharing of knowledge, ideas and transnational consultations with nations in the South Asian region and other developing and developed countries around can be a source of valuable knowledge with regards to peri-urban development and developmental planning. Nations that have made greater progress in the regularization and development of peri-urban areas can share recommendations and a set of Best Practices tailored to the local context to aid the local government administration and project planners to devise even better and more streamlined frameworks for interventions.

