Ensuring Sustainable Development through Urban Planning in Pakistan

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RECEIVED ON 13.04.2012 ACCEPTED ON 18.09.2012

ABSTRACT

Urban planning includes land use management and environmental change. It makes arrangement for community facilities and services. Since, sustainable development has been included as a vital end product of all planning goals it also provides for balanced use of land, housing and transportation and better quality of life. Present urban planning in Pakistan is not ensuring sustainable development in Pakistan. This is tested through the case study of master planning in Rawalpindi and its implementation through housing schemes in Rawalpindi, Pakistan. Large portions of provisions of master plans are not implemented. This paper explains how the urban planning will be made enabled to ensure sustainable development in Pakistan. Six numbers of housing schemes and two squatter settlements have been surveyed through questionnaires, secondary data, the opinions of the experts from related fields and site observations. Amenities and social services at far distance, very less green area, Less quantity and bad quality of water, absence of comprehensive solid waste management and sewage disposal system and non-treatment of solid waste, effluent and sewage, prevalent unhygienic conditions and air and water pollution are the existing factors effecting the sustainability. There is a need to revisit the urban planning and a comprehensive Urban and Environment Planning Law at national level and at provincial level is recommended to enable the urban planning to ensure the sustainable development in Pakistan.

Key Words: **Urban Planning, Sustainable Development, Environment, Sustainability, Master Plan.**

1. INTRODUCTION

The urban problems of Pakistan and in Rawalpindi are increasing day by day. Housing shortage is also accelerated with time. About one forth of urban population is living in squatter settlements. Traffic congestion and delays, and evolution of slums and squatters and adverse environment are common features of the urban areas. Air and water is being polluted. Resources are being wasted. Urban planning in Pakistan is continued to be institutionalized and development plans and programmes are being produced and implemented but it seems that they are not achieving sustainable urban development. The case study of master planning in Rawalpindi, Pakistan is taken as case study and its implementation through investigation of housing schemes

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and squatter settlements. Other secondary source data is also gathered, manipulated and analyzed. Present development situation evaluated. Finally the recommendations to improve the urban planning to enable it to achieve sustainable development of human settlements have been made.

2. URBAN PLANNING

Informally urban planning came into existence when the man started to think about the importance of shelter and its related facilities. Urban planning is a technical and political process concerned with the control of the use of land and design of the urban environment, including transportation networks, to guide and ensure the orderly development of settlements and communities. It concerns itself with research and analysis, strategic thinking, urban design, public consultation, policy recommendations, implementation and management [1]. In the late-20th century the term sustainable development has come to represent an ideal outcome in the sum of all planning goals [2].

Now the urban planning is one of the basic public functions in a modern urban society. Urban planning is an activity for managing the use of land and environmental change, for making provision of community facilities and services, enhancement of environment including transportation as well as for balanced use of land and adequate housing developments. The planners of the modern world include in the definition sustainable development as an important goal of Urban planning Measure.

3. URBAN PLANNING AND SUSTAINABILITY

Urban planning has a central role in achieving sustainability [3]. However, it is a service and does not necessarily result directly into goods [3]. "Urban planning is judged by its product i.e. the outcome of implementations of the planning provisions and programmes. It provides documents based on plan to be used for physical development of the human habitat. Impliedly urban planning provides beacon light for "building" the environment which is fundamental for the attainment of sustained control and development of the environment" [3].

The documents of Physical Planning are vehicles for environmental development in the immediate term and set the direction of future growth. It is achieved through the use of a plan backed-up with many legislative guidelines and administrative reports [3].

4. SUSTAINABLE DEVELOPMENT

In Brundtland report (our common Future) in the World Commission on Environment and Development [4] sustainable development has been defined as under:

"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs is sustainable Development".

It means that for an economic activity to be sustainable it must neither degrade nor deplete natural resources nor have serious impacts on the global environment inherited by future generations. When greenhouse gases build up ozone is depleted soil is degraded, natural resources are exhausted and water and air are polluted which means that present generation clearly has prejudiced the ability of future generations to support themselves.

Sustainable development links the environment, economy and social equity into practices that benefit present and future generations [5]. In the concept of sustainable

development environmental, economical and social sustainability are included to alleviate poverty and to attain quality of life for all.

5. PARAMETERS OF SUSTAINABLE DEVELOPMENT

The United Nations Centre for Human Settlements in its conference held in 1996 established the parameters for sustainable development as follows:

"Measure of sustainability In the area of human settlement as established by the United Nations Centre for Human Settlements [6] are quality of life of inhabitants, scale of non-renewable resource use, extent of recycling and re-use, the scale and nature of renewable resource use, waste produced from production and consumption activities as well as the impact of these wastes on environmental health and ecological systems".

Physical development of human settlements goes across the boundaries of conventional concerns as better social conditions, equity and better environmental standards, to issues such as concern for the impact of city-based production and consumption activities within and outside of the city [7].

It means that the waste and effluent and sewage polluting air and water and their treatment were included in the factors effecting the environment and consequently the sustainable development.

Considering the above and for this research the parameters for the sustainable development are limited upto accessibility of amenities and services, sewage and effluent and water treatment, solid waste management/ treatment, water quality and its availability and their evaluation in terms of the satisfaction level of the users of these facilities.

6. URBAN DEVELOPMENT SYSTEM IN PAKISTAN

Pakistan has responded to momentous urban challenges by establishing town planning and planning and housing departments at federal, provincial and local levels. Physical planning and housing constitute a distinct 'social' sector in Five Year Plans. The environment and Urban Affairs Division of the Federal Ministry of Housing and Works coordinates urban development and housing policies at the national level. All four provinces have established town planning and housing as ministerial functions, though under different names, in their governmental structures. Major cities such as Karachi, Lahore, Faisalabad, Islamabad, Rawalpindi etc. have autonomous development authorities, primarily concerned with planning and development activities in their respective jurisdictions. Local Government System has been introduced under PLGO (Provincial Local Government Ordinance), 2001.Three tiers of local Government are established. Many local councils have appointed town planners and beginning to exercise development control authority. The extensive network of planning agencies and activities has evolved to deal with urban problems in the country. This organizational network and its functional activities jointly frame the urban planning practice/system of Pakistan. It stands in sharp contrast with continued and increasing pain of urban problems.

7. STATEMENT OF THE PROBLEM

Rawalpindi is situated adjacent to the capital city of Pakistan at its south side. It is the fourth largest city of

Pakistan (Census Report of Pakistan, 1998). With the shift of Capital to Islamabad in 1960 Rawalpindi which acted as Interim Capital experienced rapid urbanization due to large no. of migrants [8]. Originally Master Plan for metropolitan area of Islamabad and Rawalpindi was prepared. The portion of Master Plan which relates to Rawalpindi area was not implemented due to the breakup of One Unit, with fall of Ayub Khan Government and separation of East Pakistan now known as Bangla Desh.

Later on Rawalpindi Development Working Party and Town Planning Department Punjab prepared the Master Plan of Rawalpindi in 1970 to guide and control the urban development [9]. After six years of expiry of planning period another master plan for Rawalpindi was prepared by a committee constituted by the Governor of the Punjab and Governor of the Punjab approved the same in 1996. These are the two master plans which guided the development of Rawalpindi since more than last four decades.

The urban problems of Pakistan and in Rawalpindi are increasing day by day. About 36% of its population lives in urban areas. Cities of Pakistan are failing to meet people's needs for housing, transport, environment, sanitation and water supply. Housing shortage is over 7.57 million units in 2011 [10] (Pakistan Economic Survey, 2010-2011). 78.4% of population has income so low that they cannot afford decent home, resulting in the formation of squatter settlements. About 25% of urban population lives in squatter settlements and 20% remained un-served with piped water supply. The sewerage is available to only 48% of population.

In spite of production of plans and programmes situation in Rawalpindi seems chaotic and outcomes have apparently resulted as ill planned urban areas which indicates that big public revenue has gone wasted because of the poor urban planning. Traffic congestion and delays, and evolution of slums and squatters and adverse environment are common features of the urban areas. Environment of the city is being continuously degraded and the pollution in air and water is increasing. Although urban planning in Pakistan is institutionalized and development plans and programmes are being produced and implemented but it seems that they are not achieving sustainable urban development.

8. RESEARCH METHODS

The above situation is tested through the case study of master planning in Rawalpindi, Pakistan and its implementation through housing schemes. To evaluate the effectiveness of existing urban plans with respect to sustainable development in Rawalpindi 5% of human settlements i.e. the housing schemes, Katchi abadies and slums are surveyed through structured questionnaire from the residents. Stratified research design is followed. Housing schemes namely; Saidpur Colony RDA (Rawalpindi Development Authority) old scheme on state land), Asghar Mall Housing Scheme (RDA old scheme on state land), Airport Housing Scheme (developed without approval of the concerned agency), Kurang Town (developed without approval of the concerned agency), Gulrez Housing Scheme (Initially lay out plan on 950 Kanals was approved by the concerned agency, later on the area expended over 2444 Kanals without any approval), Gulshan-e-Abad Housing Scheme (Initially lay out plan on 1000 Kanals was approved by the concerned agency, later on the area expended over 2505 Kanals without any approval), Kashmir Chaman Zar Katchi Abadi on Tepu Road and New Katrian Slum and 5% of constructed houses occupied by the residents were surveyed.

The relevant secondary data from the concerned departments had been collected. The planning experts from RDA, CDA (Capital Development Authority), TMA (Tehsil Municipal Administration) Rawalpindi and the developers of the schemes were also interviewed and their opinions were noted down. Other than these observations at site were also made. SPSS (Statistical Package for Social Sciences) is used to analyze the primary data and to draw inferences. Present development situation analyzed. Indicators responsible for non-achievement of sustainable development are determined and also the reasons and causes thereof. Finally the recommendations to improve the urban planning to enable it to achieve sustainable development of human settlements have been made.

9. FIELD INVESTIGATION AND DISCUSSIONS

9.1 Based on Observation Sheets, Opinion of the Experts and Secondary Data

9.1.1 Housing schemes

All the schemes except the old Housing and Physical Planning Department schemes i.e. Saidpur colony and Asghar Mall scheme have been developed without prior approval of development plans which indicate unsustainable development and weak building and development control and much less implementation of provisions of Master plans and rules and regulations by the liable agency. The area allocated for education and green (parks and play grounds) in the housing schemes are far below than the prescribed planning parameters in Punjab i.e. not less than 2 and 7% respectively. 1.18 acres/ 1000 persons green area was exited in 1970 [11] which was decreased to 0.69 acre /1000 persons in 1996 [12]. Standard fixed in the Master Plan 1970 was 3 acres /1000 persons which were subsequently lowered down to 1 acre/1000 persons in Master Plan 1996 [13]. Total land required for green estimated for year 2016 is 2872 acres. Not a considerable land has yet been reserved, acquired, planned and developed for green upto 2011. Acute shortage of green area is at Neighborhood and sub Neighborhood levels. The city is surviving with very small lungs [14].

The lungs of the schemes are so small and weak that the schemes cannot be considered as living organisms. The area for public buildings in the schemes is negligible. The commercial area provided in the scheme is also on lower standard. No site for graveyard is allocated in the schemes. The street width is 30 ft. or less. The area having larger and unstable slopes is developed into residential plots threatening the human life. Water is supplied not according to the requirement. The proposals formulated in the Master plans of Rawalpindi (1996-2016) to bring the water from the dams namely Cherrah, Trimna and Salkhatar are not even materialized as yet. The proposals are not matured due to lack of funds. Quality of water is also not satisfactory. Diseases caused by the quality of water and unhygienic conditions have also been reported. Although, the sewers are laid in the schemes but outlet of these is in nallah, water streams and rivers without any treatment which is polluting the water. According to the proposals mentioned in the Master plans dated 1970 and 1996 a site has been acquired along Soan River at Gorakhpur after lapse of 40 years but the project of building of Sewerage Treatment Plant shelved. No comprehensive sewerage and drainage system is existed in the city though sewers lines have been laid in about 35% of its area. Water streams are converted into trunk sewers. Surface and underground water has become

injurious for health of the residents of the city. Solid waste is also being collected but not completely. Mostly it is dumped in the large right of way of high ways/roads and at the bank/slopes of rivers/nallahs and also in the depressions. A small planned dumping site is located at far distance at Chak Beli Khan Road at Losar Rawalpindi. This dumping site has been used upto about its full capacity but dumping of waste is still continues at site. Dumping of the waste at the planned site is open sometime covered with mud. Waste is also being dumped in the right of way of Soan River at Soan camp. Another dumping site is at Misrial road at Bhata where open dumping of solid waste is being carried out. These have severe environmental impacts. Underground and surface water and air is being polluted effecting the natural resource and health gravely. Due to absence of facilities and services at appropriate distance travel trips and lengths thereof have been increased manifold. More cost and air pollution are the consequence. No site for sewerage treatment plant has been allocated in any of the scheme. Schools, Beauty Parlor, Clinics, shops and offices are the most frequent non conforming uses in residential plots. It seems that the most of the schemes are simple sub division of land into market and commercial. Conversion of land use of amenities areas into residential have been reported by most of the respondents in the schemes which is effecting the quality of life.

9.1.2 Chaman Zar, Katchi Abadi, Tepu Road and New Katrian Slum

These had been developed on the private land. Streets were very narrow and zig zag. There is a little chance of air and sun vent. Houses are served with soak pits with katcha base and injurious waste water is percolated into the earth. Water is being extracted from the earth and used for drinking purpose. Diseases of cholera and stomach infection and Hepatitis are reported. No collection of solid waste which is scattered in streets. Hygienic conditions in the schemes are the worst. Therefore, development is totally unsustainable.

9.2 Based on the Primary Data

Table 1 indicates that one has to travel averagely 2.69-4.83 Kms to approach primary school except in the Asghar Mall Scheme. The Saidpur scheme is an old scheme having no primary school and secondary school but these are existed in the adjacent schemes. In case of secondary school, average distance ranges from 3.12-6.30 Kms. Car/van is mostly used for of this facility.

TABLE 1. ACCESSIBILITY TO EDUCATIONAL INSTITUTIONS & AMENITIES (DISTANCES IN KILOMETERS)

No.	Housing Schemes (Rawalpindi)	Average Distance to Primary School	Average Distance to Secondary School	Average Distance to Shopping Centre	Average Distance to Hospital/Clinic	Average Distance to Parks
1.	Airport society Housing scheme	2.74	5.09	5.06	5.34	7.04
2.	Asghar Mall	0.25	3.12	2.11	2.01	3.03
3.	Gulrez Housing Scheme	2.69	6.00	6.14	7.01	6.85
4.	Gulshan-e-Abad Housing Scheme	4.83	6.30	5.67	6.36	5.71
5.	Kurang Town	3.20	4.12	4.70	6.30	4.62
6.	Saidpur Colony	3.31	4.13	2.70	2.49	3.45
Source: Field Survey by the Author in Rawalpindi						

For shopping the average distance required to avail the facility is from 3.11-6.41 Kms while it is 2.01-7.01 Kms for hospital. More distance i.e. 5.34-7.01 Kms for the hospital in case of newly planned and developed schemes i.e. Airport, Gulrez and Gulshan-e-Abad Housing Schemes and the Kurang Town. Green area is very less in the schemes and distance from 3.03-7.04 Kms is required to be travelled to use the facility.

The existing situation clearly indicates that facilities are not planned and developed at optimum/walking distances. Accessibility through walking is not possible/preferable. Most of the persons use car/van to approach these facilities. 30-40% are not even going to visit park/ playground. Availing facilities located at far distance are more costly and time talking. More fuel is to be extracted and is burnt.

Elemental composition of crude oil and gas is composed of carbon 84-87%, Hydrogen 11-14%, Sulfur 0.6-8% and Nitrogen 0.02-1.7% [15]. It means extracting and burning fuels produce Hydrocarbons, CO_x, SO_x and NO_x.

Resultantly more greenhouse gases and SO_x and NO_x go into the air and in atmosphere causing climate change, global warming and rupture of O-zone layer, effecting health of the resident. Thus It is evident that the development is unsustainable.

Table 2 indicates the water supply to the residents of the schemes with reference their need fulfillment. 24.89% of the residents are getting water only fulfilling their 40 % or less need. This is due to that the proposals mentioned in the Master Plan of Rawalpindi (1996-2016) regarding construction of dams and obtaining the water from these dams to be built in future have not been materialized as yet. There is acute shortage of water in Rawalpindi. Only 22.75% of respondents are getting water according to their needs.

In Table 3 potable water is defined for the study is that water which is not causing any disease. The quality of water supplied is also not appreciable. Bad quality of water has been reported by 27.27% in Airport Housing Scheme. 39.13% in Asghar Mall Scheme, 24.39% in Gulrez Housing scheme, 4.41% in Gulhshan-e-Abad Scheme, 5.40% in Kurang Town, 40% in Saidpur Colony and due to this 6.87 caught diarrhea and 11.16 % suffering from stomach infection. This situation indicates the water pollution and scarcity of water. The residents are suffering from diseases. Quality of water is worse in old schemes i.e. in Saidpur and Asghar mall housing schemes due to the very old rusting water system laid almost a half decade ago in addition to the other reasons.

TABLE 2. WATER AVAILABILITY

Housing Scheme Rawalpindi	Water Quantity				Total No. Respondents
	100 (%)	80 (%)	60 (%)	40 or Less (%)	
Airport Housing Scheme	1	19	8	16	44
Asghar Mall Scheme	8	11	2	2	23
Gulrez Housing Scheme	13	14	11	3	41
Gushan-e-Abad Scheme	18	20	14	16	68
Kurang Town	10	8	6	13	37
Saidpur Colony	3	4	5	8	20
Total	53	76	46	58	233
Percentage	22.75	32.62	9.74	24.89	100
Source: Field Survey by the Author in Rawalpindi					

Table 4 shows the hygiene of the residential area of the schemes. The sweeping of roads have not been done 31.82% in Airport scheme, 56.52% in Asghar Mall, 48.78% in Gulrez, 60.29% in Gulshan-e-Abad, 43.24% in Kurang and 65% in Saidpur Colony. Hygienic conditions in the schemes are alarming. Provision of this municipal service is responsibility of the sponsoring society who is not fulfilling its duty. Due to this mosquitoes and flies are in abundant those are causing diseases.

Tables 5-6 indicate that the residents of the newly planned and developed schemes have high level of dissatisfaction about the provision of social services i. e. primary school, secondary school, and shopping facility as their index of satisfaction level falls below zero. In the Gulrez and airport housing schemes the satisfaction level for the shopping facility is relatively high as the existed roads i. e. Bastami road and airport link road which provide access to the scheme are highly commercialized. The satisfaction level of only the residents of Saidpur colony is very high as the

TABLE 3. QUALITY OF WATER VERSUS DISEASES

Quality of Water		No.	Percentage	Diseases			Total No. of Respondents
				Diarrhea	Cholera	Stomach Infection	
Airport	Potable	32	72.73	0	0	0	44
Housing Scheme	Not Potable	12	27.27	2	0	10	
Asghar Mall	Potable	14	60.87	0	0	0	23
Scheme	Not Potable	9	39.13	4	0	5	
Gulrez Housing	Potable	31	75.61	0	0	0	41
Scheme	Not Potable	10	24.39	6	0	4	
Gulshan-e-Abad	Potable	65	95.59	0	0	0	68
Housing Scheme	Not Potable	3	4.41	0	0	3	
Kurang	Potable	35	94.60	0	0	0	37
Town	Not Potable	2	5.40	1	0	1	
Saidpur	Potable	12	60.00	0	0	0	20
Colony	Not Potable	8	40.00	3	1	4	
Total		233		16	1	26	233
Percentage			100.00	6.87	0.43	11.16.	

Source: Field Survey by the Author in Rawalpindi.

TABLE 4. TIMING FOR SWEEPING VERSUS OCCASION OF SWEEPING OF ROADS / STREETS

Time for Sweeping (Morning)	No.	Days of Sweeping				No Timing	Total No.
		Daily	Alternate Day	Once a Week	Not Done		
Airport Housing Scheme	32	2	14	14	2	12	44
Asghar Mall Scheme	10	1	2	7	0	13	23
Gulrez Housing Scheme	21	1	3	17	0	20	41
Gushan-e-Abad Housing Scheme	27	0	8	13	6	35	68
Kurang Town	22	2	10	9	1	15	37
Saidpur Colony	20	0	2	5	13	0	20

Source: Field Survey by the Author in Rawalpindi.

good quality of private primary and secondary schools are existed in Satellite Town and along sixth road.

Tables 7-8 indicates that the residents of newly planned and developed schemes showed high level of dissatisfaction towards provision of parks and play fields, public transport and water quality and quantity. The index of satisfaction level of the residents is below zero/negative. Only in asghar mall scheme the satisfaction level is high as three small parks are developed in the scheme. Bad quality and less quantity of water in the schemes is again confirmed by above table of the index of satisfaction. High level of dissatisfaction regarding non-availability of the public transport and road network is due to absence of public transport routes within the scheme area or at a reasonable walking distance. In Saidpur colony streets are very narrow and are not even capable of accommodating the public transport. This situation indicates that quality of life is poor in the schemes.

In the residential houses schools, beauty parlors and clinics are operating which is reducing the quality of residential area and causing noise pollution and also indicates the weak control of the authority.

In the housing schemes planned and developed by the private sector the green area existed at ground ranges from 1.06-0.85% which is far less than the standard prescribed i.e. at least 7%. No area for grave yard in the housing schemes has been reserved. Area planned in the schemes for the public building use limits from 0.00-0.41% against the prescribed standard of 5-10%. This indicates that lungs of the human settlements are so small that they are near to be seized as living organism (Table 9).

TABLE 5. SATISFACTION LEVEL OF RESIDENTS WITH RESPECT TO THE FOLLOWING FACILITIES PROVIDED IN THE SCHEME AREA

No.	Housing Schemes Rawalpindi	Primary School			Secondary School			Shopping Facility		
		Satisfied	In-Different	Dissatisfied	Satisfied	In-Different	Dissatisfied	Satisfied	In-Different	Dissatisfied
1.	Airport Housing	46	0	54	5	0	95	69	0	31
2.	Asghar Mall	66.7	0	33.3	8.3	0	91.7	100	0	0
3.	Gulrez Housing	33	0	67	0	0	100	56	0	44
4.	Gulshan-e-Abad	48	0	52	21	0	79	36	0	64
5.	Kurang Town	51	0	49	29	0	71	28	0	72
6.	Saidpur Colony	100	0	0	100	0	0	90	0	
Source: Field Survey by the Author in Rawalpindi.										

TABLE 6. YEH'S INDEX OF SATISFACTION LEVEL OF RESIDENTS WITH RESPECT TO THE FOLLOWING FACILITIES PROVIDED IN THE SCHEME AREA

No	Human Settlements	Primary School	Secondary School	Shopping Facility
1.	Airport Housing	-0.08	-0.90	0.38
2.	Asghar Mall	0.33	-0.83	1.00
3.	Gulrez Housing	-0.34	-1.00	0.12
4.	Gulshan-e-Abad Housing	-0.04	-0.58	-0.18
5.	Kurang Town	0.02	-0.42	-0.44
6.	Saidpur Colony	1.00	1.00	0.80
Source: Field Survey by the Author in Rawalpindi.				

10. CONCLUSIONS

Conversion of use of land into housing schemes without prior approval of local planning agency is frequent. The housing schemes are simply land sub division into residential and commercial. No planning parameters are being followed. Land is not being used according to its capabilities. Negligible area is being allocated to green, social services, amenities and public buildings in the Housing schemes. This has increased the frequency of travel trips and the length travelled. More non-renewable resource i.e. fossil fuels are being extracted and burnt. This causes depletion of natural resources and emission of green house gases, SO_x, NO_x and Hydrocarbons causing global warming, climate change, depletion of O-zone layer and acid rains. This is affecting human life injuriously. Water and air is being polluted due to absence of comprehensive sewerage and drainage system and Solid waste Management. Municipal services are almost absent in the area. This shows that negligible planning, building and development control is being exercised by the concerned agencies.

The environmental aspects with reference to sustainable development are total ignored as no sewerage Treatment Plant, very little water treatment and solid waste management has been established/exercised in the schemes. The solid waste/effluent produced during the

TABLE 7. SATISFACTION LEVEL OF RESIDENTS WITH RESPECT TO THE FOLLOWING FACILITIES PROVIDED IN THE SCHEME AREA

No.	Human Settlements	Parks and Play Fields			Road Network			Public Transport			Water Quality and Quantity		
		Satisfied	In-Different	Dissatisfied	Satisfied	In-Different	Dissatisfied	Satisfied	In-Different	Dissatisfied	Satisfied	In-Different	Dissatisfied
1.	Airport Society Housing Scheme	10.5	0.0	89.5	78.5	6.5	15.0	23.5	0.0	76.5	31.5	3.5	65.0
2.	Asghar Mall	91.7	0.0	8.3	33.3	58.3	8.3	35.0	8.3	56.7	25.0	16.7	58.3
3.	Gulrez Housing Scheme	16.0	0.0	84.0	55.0	5.0	40.0	2.7	0.0	97.3	41.0	5.5	54.5
4.	Gulshan-e-Abad Housing Scheme	6.0	0.0	94.0	37.0	3.0	60.0	6.3	93.7	6.3	37.0	0.0	63.0
5.	Kurang Town	5.0	0.0	95.0	40.5	0.0	59.5	44.5	0.0	55.5	51.0	0.0	49.0
6.	Saidpur Colony	0.0	0.0	100.0	45.0	10.0	45.0	5.0	0.0	95.0	20.0	0.0	80.0
Source: Field Survey by the Author in Rawalpindi													

TABLE 8. YEH'S INDEX OF SATISFACTION LEVEL OF RESIDENTS WITH RESPECT TO THE FOLLOWING FACILITIES PROVIDED IN THE SCHEME AREA

No.	Human Settlements	Parks and Play Fields	Road Network	Public Transport	Water Quality and Quantity
1.	Airport Society Housing Scheme	-0.79	0.63	-0.53	-0.33
2.	Asghar Mall	0.83	0.25	-0.21	-0.33
3.	Gulrez Housing Scheme	-0.68	0.15	-0.94	-0.13
4.	Gulshan-e-Abad Housing scheme	-0.88	-0.23	0.00	-0.26
5.	Kurang Town	-0.90	-0.19	-0.11	0.02
6.	Saidpur Colony	-1.00	0.00	-0.90	-0.60
Source: Field Survey by the Author in Rawalpindi					

activities of consumption and production is not being processed/treated and dumped in the right ways of roads/ highways and water steams polluting air and water and waste of resources. Land use conversion gives rise to nonconforming uses which is cause of noise pollution and deteriorating quality of residential areas.

In addition comprehensive planning is missing. Very development and building control is being exercised. Provisions of Master Plans are not being followed as these were/are not approved by the liable local agency.

11. RECOMMENDATIONS

On the basis of the above analysis following are recommended to enable urban planning to ensure sustainable development in Pakistan.

(i) By amending urban planning process every local body be made entrusted to prepare urban and environmental development plans for their own areas. Local agency will be made responsible for planning and approval of the development plan and for effective building and development control in its areas.

(ii) Uniform planning and environmental standards be framed which applies throughout the area of the province. The standards and procedures prepared by Pakistan Environmental Protection Agency under Pakistan Environmental Protection Act for environmental clearance of the development project are too encumbersome and over whilwing to employ hence these are not being implemented and therefore, needed to be amended [17] as none of the housing schemes in Rawalpindi has not acquired environmental clearance before their development.

(iii) Urban and environmental development plans should be prepared keeping in view the target population. Within these plans projects/schemes be proposed accordingly.

(iv) In urban and environmental development plans Real Projects be proposed and financed in real terms. Public Private Participation may be used as a tool. Simultaneously some more land is acquired along with the projects to cover the cost or to subsidize them. Therefore, projects be made self supporting and self financing by introduction of cross subsidy.

(v) Public participation in the planning process,

TABLE 9. GREEN AREA, GRAVEYARD AND PUBLIC BUILDING AREA PERCENTAGES IN HOUSING SCHEMES

No.	Human Settlements	Green Area		Public Building Area		Graveyard	
		Prescribed (%)	Existing (%)	Prescribed (%)	Existing (%)	Prescribed (%)	Existing (%)
1.	Airport Society Housing Scheme	7.00 and Above	1.06	5-10	0.41	2 and Above	0.00
2.	Asghar Mall	7.00 and Above	1.23	5-10	0.21	2 and Above	0.00
3.	Gulrez Housing Scheme	7.00 and Above	0.89	5-10	0.29	2 and Above	0.00
4.	Gulshan-e-Abad Housing scheme	7.00 and Above	0.85	5-10	0.16	2 and Above	0.00
5.	Kurang Town	7.00 and Above	1.02	5-10	0.12	2 and Above	0.00
6.	Saidpur Colony	7.00 and Above	2.19	5-10	0.00	2 and Above	0.00
Source: Field Survey by the Author in Rawalpindi and Punjab Housing Schemes and Land Subdivision Rules, 2010 [16].							

monitoring and evaluation and revision of plans and programs for better effectiveness of urban and environmental development plans be made mandatory and part of the urban planning process.

(vi) Institutional framework of the agency liable to implement the urban and environmental development plans should be detailed out in the development plan and powers and duties and responsibilities of the officers/official implementing the plan should be clearly spelled out backed by a strong legal framework. The officers especially who are entrusted to implement the proposed plans and programmes should be made accountable.

(vii) Provision of compulsory acquisition of land for public purposes i.e. housing for low income group, railway line, railway stations, sewerage treatment plants, Landfill sites, trunk sewers be made in Land Acquisition Act and the local agency be empowered in this connection. The payment of the land and building compensation be allowed to be paid in installment with some reasonable interest. For this necessary law be amended.

(viii) To promote the implementation of mitigation programmes campaign on environmental issues and programmes and plans be framed. The important points relating to the campaign be spelled out in the urban and environmental Development Plan.

(ix) Continuous evaluation of programs and plans and their effectiveness should be ensured by an independent body at regular intervals. This should be made mandatory and part of the Plan.

(x) A comprehensive solid waste management system be made an essential part of the Urban and Environmental Development plan and also the fiscal support.

(xi) Arrangement of use of renewable source of energy like solar energy in the country be programmed as ample of sun shine is available in Rawalpindi.

(xii) The prescribed planning parameters are not being implemented for one reason or the other in all of the housing schemes. These need revision according to the socio economic conditions of the country. Maximum size of residential plot and housing density need to be reviewed and size be rationalized after a detailed study as the target population is the low income people where the housing deficit is maximum. Minimum size of the scheme should be determined in view of the comprehensive planning and sustainable development. Yardstick for this can be any fundamental component like mosque, primary school, park, etc.

(xiii) For ensuring security and safety gated sub neighbourhoods may be considered as a part of urban and environmental development plan having efficient communication links with other communities.

(xiv) To make the neighbourhoods green, self sufficient and energy efficient following are recommended to be made part of the urban and environmental development plans.

- The neighbourhoods be made pedestrianized and cyclized. Walkable and cycleable distances for primary schools, secondary schools, dispensary/ clinic, local shopping centers and green area be ensure.

- Provision of safe walking and cycle tracks along the vehicular streets may be made part of the development plans.

- High level facilities and services like large shopping centers, hospitals, colleges/ universities, etc will be planned on residential density basis.

- Relatively large percentage of green areas should be allocated to the parks at sub-neighborhood level to make it green, self sufficient and energy efficient.

(xv) Water should be metered and charged accordingly. Water conservation strategies and its treatment to maintain the good quality of water should be made mandatory.

(xvi) Along the existing main roads and water streams, trunk sewers capable of accommodating the existing and the future estimated sewage be planned and developed by the local agency. Available foreign aids/soft loans form UN formations for this infrastructure be obtained be developing the feasibility. Subsidized cost if any should be recovered from the beneficiaries in very easy installments.

(xvii) Two sites for STP (Sewage Treatment Plants) at city level be arranged according to the contours of the city. One site of STP at river Soan has already been acquired. Running expenditure of the STPs may be borne by the composting to be done at site. Available foreign aids/soft loans form UN formations for this infrastructure be obtained by developing the feasibility. Subsidized cost if any should be recovered from the beneficiaries in very easy installments.

(xviii) Planning and development of engineering landfill site along with composting site be made part of the master plan. Available foreign aids/soft loans form UN formations for this infrastructure be obtained by developing the feasibility. Subsidized cost if any should be recovered from the beneficiaries in very easy installments. Alternatively public private partnership should be used to finance the project.

(xix) Major portion of solid waste is biodegradable which can be converted into good quality of compost, a commercial commodity. Prerequisite for this is that the biodegradable waste be collected separately at the source level. Proper arrangement to collect solid waste into two categories i.e. Kitchen and the waste other than kitchen by the local liable agency should be made. Cost of running the landfill site be recovered by producing the compost. It is also a resource conservation strategy. This provision is made a mandatory part of the urban and environmental development plan.

(xx) For segregation of the waste at source level the local agency shall design a campaign and launch to motivate the resident to separate the waste into two categories.

ACKNOWLEDGEMENTS

The authors are grateful to Dr. Abdul Waheed and Dr. Obaidullah Nadeem, University of Engineering & Technology, Lahore, Mr. Khaliq-ur-Rahman, Director Capital Development Authority, Islamabad, Mr. Aftab Jamshad, Director, Mr. Samee Khan, Deputy Director, Planning, and Mrs. Aisha Waseem, Assistant Director, Rawalpindi Development Authority, Rawalpindi, Pakistan, for providing the useful and required information.

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