Residential Development and Infrastructural Satisfaction in Peri-Urban Areas of Amritsar

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ABSTRACT

Increasing urbanisation has led the cities to sprawl beyond their municipal limits on the rural lands, known as peri-urban areas. The development in the peri-urban areas is characterised by conversion from agricultural land to other land uses. The upcoming new development in the peri-urban results in various changes in socio-economic and physical characteristics. Punjab Urban Planning & Development Authority (PUDA) approved planned, regularised, and unplanned/ unauthorised residential developments in the peri-urban area of the Amritsar metropolis are appraised to assess the level of satisfaction of residents about the basic amenities available within it.

Keywords: *Peri-Urban Areas, Residential Development Type, Infrastructure.*

INTRODUCTION

The development in the periphery of the city results from sprawl. Such development reflects both the urban as well as rural features. Therefore, the term peri-urban areas is used for the areas which are just beyond the municipal limits of the city. While defining the peri-urban areas, Andrew (1942) has described it as the area having inter-mingling of agricultural characteristics and urban land uses. Sarkar (2013) has referred to it as "complex mosaics of juxtaposed activities previously regarded as incompatible". The peri-urban areas encounter a unique pattern of land use and are often designated as areas of "mixed land use". Further, Dikshit (2011) notes that the peri-urban area is a space

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segment lying between the urban complexes on the one hand, and the vast rural countryside, on the other hand. Gajendran (2016) states that the term peri-urban area is not fully explicable because of the complexities and ambiguities involved in it. Thus, the peri-urban area is the zone of transition having the characteristics of both urban and rural areas that keep on changing. Thus Jennifer (2014) has said that theoretically this term is not having a standard definition and it is used in various forms of formal and informal settlements. Except this, the peri-urban areas comprise various salient features such as:

- There is continuous development outside the municipal limits characterised by both rural and urban features.
- The development is in the form of patches indicating the change in land use from agriculture to non-agricultural activities. Sometimes the new physical development is surrounded by agricultural land use.
- The villages in the peri-urban areas are characterised by urban features such as small to large townships, departmental stores, large showrooms, increasing vehicular movement but limited public transport vehicular movement.
- The physical characteristics in the areas do not show as the compatibility between the land uses and the growth looks haphazard and sporadic in nature.
- The residential development is a fusion of both planned and unplanned growth. The residential development that takes place in the peri-urban areas is not affordable for all income groups because the area is characterised by private development which is profit-oriented only.
- Generally, the large mass of land is under residential use with minimum occupancy.
- The pattern of development in the peri-urban is influenced more from the hierarchy of road also.
- The provision of infrastructure is through the private developer largely which affects the cost of the plot/flat in the planned residential site.

BRIEF ABOUT AMRITSAR

Located at 31.63oN 74.87oE at an elevation of 234 meters (Wikipedia, 2018), Amritsar is more than four centuries old important historic city

of North India and is spread over 142.38 Km_2. Popularly known for its famous Golden Temple, the city has its roots of development in the medieval era. The organic but compact mixed land use development within the Walled City and along the radial roads featured with sporadic sprawl in the outskirts explain the inclusive and exclusive spatial structure of this historic city. Amritsar, being a historic centre for tourism, trade, commerce, and having high connectivity through road, rail and air, attracts nearly 0.1 million tourists each day. Polarization of tourism-related economic activities in the city has led to high in-migration and population growth. The population dynamics of Amritsar reveal that its population get doubled in five decades, i.e. from 0.16 million in 1901 to 0.34 million in 1951, which grew by about three times in the next six decades, i.e. during 1951-2011 (Census of India, 2011). A small city was ranked 33rd metropolis of India and 2nd of the State in 2001. The city inhabited an estimated 1.32 million persons in 2018 (Population City, 2018). The increased population of the city has led to increased demand for land to accommodate various activities. But the paucity of urban vacant land (3 per cent as per Amritsar Master Plan, 2031) has resulted in developing the rural lands around its municipal limits. The planned development outside its municipal boundary has come under various provisions of the Acts. But many unplanned residential colonies have also come up in its peri-urban areas, some of which are regularised under the provisions of the new Enactments by the Government of Punjab.

Methodology

The present research paper is an effort to appraise different types of residential developments in the peri-urban areas and the level of satisfaction of their residents for the basic services available in them. For the same, area-level study is conducted to understand the characteristics of the residential development, and the colony level studies (planned, unplanned, and regularised) are organised to assess the level of satisfaction of their inhabitants in the peri-urban area. Both the secondary and primary data/ information is used to analyze different aspects of the study.

Characteristics of Peri-Urban Areas of Amritsar

Amritsar agglomeration consists of 23 outgrowths in different directions around it. The residential development in the peri-urban areas started coming up in the late 1980s. Till 2001, the development was largely unplanned. Thereafter, planned residential colonies started up on the rural lands outside its municipal limit with the approval of the Punjab Urban Development Authority (PUDA) under the provisions

of the Punjab Apartment and Property Regulation Act (PAPRA), 1995. Various policies, provisions and norms have been implemented for the promotion of small as well as mega projects of the Government of Punjab. Further, an Act called the Punjab Laws (Special Provisions) came into existence in 2013 to cover the unplanned development in the planned umbrella through the provisions of basic infrastructure. Hence, due to these legal provisions, the residential development in the peri-urban areas is characterised by three types as viz., PUDA approved planned development, regularised development, and unplanned unauthorised development. About 16 per cent of rural land is developed for features of these developments.

PUDA Approved Planned Development

As a result of proactive housing policies, guidelines of the Punjab government and a simplified approval procedure, as many as 61 planned colonies have come up in the peri-urban areas of Amritsar, the majority of which are concentrated in its northern and eastern directions. These colonies account for 44.3 per cent of the total planned development occurring during 2001-2010. Higher accessibility to transport, commercial, educational and medical facilities along with increased economic activities are the reasons for the preference of the colonizers to bring up planned developments in these directions. Out of 61 colonies, 22 colonies (37 per cent) having an area less than 10 acres area (designated as small colonies) are developed in 182.24 acres area, which accounts for about 20.6 per cent of the total residential area of the peri-urban areas. Also, 17 colonies (27.9 per cent) having an area between 10-25 acres (designated as medium-sized colonies) and 17 colonies having areas between 25-100 acres (designated as large colonies) have been developed on 300 acres, 493.5 acres as during 2001-2015 respectively. After October 6, 2006, five large-sized integrated townships (called mega townships) having 100 acres and above got developed on 783.6 acres area, which accounts for eight per cent of the total planned residential colonies. These townships provide all the basic services and facilities and also reserve five per cent area for the Economically Weaker Section (EWS) class and provision of waste management too. Thus, the peri-urban areas of Amritsar are characterised by different sizes of planned residential colonies. Resultantly, they lack integration of infrastructure as they are developed as individual entities. Also, the colonizers do not develop the approved components of the respective layouts.

A primary survey, conducted for the planned colonies in the peri-urban areas of Amritsar, revealed that the small-sized colonies (less than 10 acres) are growing in higher number but they lack the

required infrastructure. Even the medium and large colonies do not possess sufficient infrastructure. The operation and management of infrastructure in these colonies are based on the contributions made by the residents as per their plot area. Besides, no environmental issues are taken into consideraton for waste management as all these colonies are located near the drain or the agricultural land and their sewage is disposed of in their surroundings only. No effort is made to conserve the storm water through rainwater harvesting techniques. While mega townships are good in physical infrastructure provisions but after eleven years of their development, educational and medical facilities are still absent. Their inhabitants have to depend on the mother city to avail these facilities. As these townships are occupied by only the High Income Group and Medium Income Group population, therefore, their mobility is through their private modes only. Only a few colonies are accessible through the public transport system.

Regularised Development

Regularised development is the outcome of the Punjab Laws (Special Provisions) Act, 2013 which has facilitated the unauthorised developers and their plot holders to get their colonies or plots regularised by paying suitable charges/fees. The Act remained operative for one year i.e., from April 17, 2013 to April 16, 2014. During this period, 123 unauthorised colonies developed on 699 acres have been regularised, which account for about 12.6 per cent of the total development of the peri-urban areas of the city. These colonies are developed over an area ranging between one acre to 23 acres individually. The survey conducted for them reveals that infrastructure is absent in all of them. Also, no effort has been made by the government to provide the basic amenities like water supply, sewerage, and adequate roads, etc. to their inhabitants even after their regularization, which is against the commitment by the government under this Act to ensure a better quality of life to the residents.

Unplanned Development

About 1780 acres area is developed as unplanned residential one, accounting for about 52.9 per cent of the total residential development in the peri-urban areas of Amritsar. These colonies are illegally developed by the private colonizers and farmers on the agricultural lands. The development in these areas/colonies is characterised by varying plot sizes, zig-zagging roads, and unplanned or absent social and physical infrastructural provisions. The major issues of these colonies are their inadequate infrastructure and lack of integrated development.

Thus, the peri-urban area of Amritsar has a mix of planned,

unplanned, and regularised development indicating the efforts of the state government to develop the periphery of the city in a planned manner having adequate and quality infrastructure. Analysis of the survey reveals that livability conditions in the planned developments are far from satisfactory as basic infrastructure is either absent or inadequate in them. While the objectives of the policies of the government were to resolve the problem of housing and infrastructure but neither of them is achieved barring a few examples in mega projects.

RESIDENTS' SATISFACTION

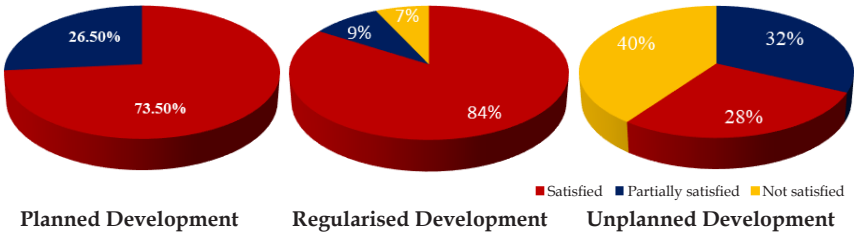
As discussed in the previous section that infrastructural facilities are absent or inadequate not only in the unplanned colonies but also in the planned colonies, it becomes important to examine the inhabitants' satisfaction level for the basic amenities such as water supply, sewerage, solid waste, and electricity. A sample household survey is conducted about the satisfaction level of the inhabitants of the planned, regularised, and unplanned colonies. Following are the results of the investigation:

Water Supply

To test the satisfaction level of the residents for water supply parameters such as the provision of water supply (government or private developers or both), source of water supply (tube well or overhead reservoir), the pressure of water, sizes of pipes, quality of water, and operation and maintenance of water supply system are investigated.

It is clear from Fig. 1, that 73.5 per cent of residents of planned colonies are satisfied with the water supply facilities available within their vicinity. The rest of the residents are partially satisfied with the water provisions in their colonies. It is worth noticing that out of 73.5 per cent, about 17 per cent satisfied inhabitants reside in large and megaproject colonies where the quality and supply of water are managed by the colonizers. Good quality and quantity of water provision and regular maintenance of pipelines, online operation of water supply

Fig. 1: Satisfaction from Water Supply



Source: Field Survey, December 2019 and January 2020.

through the colonizers are the reasons for their satisfaction. About 18 per cent of the respondents from medium size colonies are satisfied due to the availability of their private bore well connections and water through the overhead reservoir too is available in some colonies, otherwise, they have an intermittent water supply for two hours three times a day. About 26.5 per cent of the respondents from small to medium colonies are partially satisfied. Lack of availability of O.H.R within the site and lack of colonizer interest to improve the water supply within the locality are the main reasons behind their partial satisfaction.

The residents of regularised colonies depend upon their individual sources of water supply except for one locality where the water is supplied through the municipal corporation and private connections as well. Individual private connections make them satisfied. About nine per cent of respondents are partially satisfied with the available source of connection. The residents having public sector water supply connections are also partially satisfied because of the intermittent supply of water and low pressure of water. The study also reveals that about seven per cent of the total respondents of regularised localities are not satisfied with the water supply system as no efforts from either the government or the developers are made to provide good quality of water in sufficient quantities.

About 32 per cent of respondents from an unplanned area are satisfied with the quality and quantity of water. Availability of private as well as government connections of water fulfills their water requirements for the whole day. About 28 per cent of residents are partially satisfied as the water pressure is not maintained due to illegal booster pumps installed by the well-to-do residents. There is no action on them for their illegal deeds. About 40 per cent of respondents who have private connections are not satisfied on account of frequent power cuts resulting in the inadequate water supply.

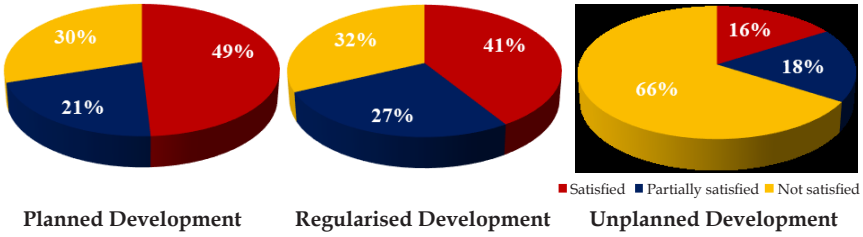
Thus, on an average, about 22.5 per cent and 62 per cent of inhabitants of the peri-urban areas are satisfied and partially satisfied with the water supply system in their respective residential colonies. All the residents of large and megaproject residential colonies are satisfied, whereas about 24 per cent of the residents of regularised and unplanned colonies are not satisfied with the water supply system. Hence, planned development has proved to be a better proposition in terms of provision of the basic and essential commodity, i.e. water. The residents of the small and medium-sized colonies are satisfied not because of the efforts of the colonizers or developers but because of their own arrangements for water supply. A similar situation prevails in regularised or unplanned areas as well.

Sewerage System

With the purpose to assess whether the sewerage system of the residential colonies of the peri-urban areas is properly handled or not, without causing many health and environmental problems, the satisfaction level of the inhabitants has been examined with respect to the period of laying the sewer lines, the hierarchy of pipes, the system of sewerage collection, disposal and treatment, the proportion of the area developed and access of sewer lines. Following are the results of the study:

It is clear from Fig. 2 that about 49 per cent of the respondents of planned colonies are satisfied with the sewerage system of their colonies. There is no problem of choking of the sewer and operation and maintenance of sewer lines is done twice a year by the colonizer. Availability of an online portal to get their problem resolved is another reason for their satisfaction. The treated water is used for horticulture within the township. The residents of medium and large colonies are also satisfied as there is no problem of choking of the sewer and its cleaning is done on a regular basis by the colonizer.

Fig. 2: Satisfaction from Sewerage System



Source: Field Survey, December 2019 and January 2020.

About 21 per cent of the respondents of some of the planned localities are partially satisfied because the absence of main sewer pipe leads to frequent choking of sewer and disposal of untreated sewer in the open despite having a sewerage treatment plant (unoperational) within the site makes it environmentally unpleasant. All the small-sized planned colonies also have underground utility corridors. About 30 per cent of respondents of the small colonies (planned) are not satisfied with the existing sewerage system due to its frequent choking, no efforts from the colonizer to clean the sewer lines regularly, and disposal of the untreated sewer in the surrounding fields.

Conditions are more or less similar in the regularised colonies as well where about 41 per cent of residents are satisfied with the existing

sewer facilities provided to them. The sewer lines are laid by the village panchayat or the residents themselves have laid it. About 27 per cent of the respondents are partially satisfied because of absent sewer lines resulting in dependence on septic tanks for the collection of sewage. About 32 per cent of households are not satisfied because they do not have sewer lines in their localities. The developer collects Rs. 500/- from each household each year, but no sewer line is laid as yet. Hence, the residents laid the sewer lines on their own in their respective streets without giving any regard to the overall gradient in the area. This may lead to the problem of choking in the future. The untreated sewage is disposed of in the vacant plots which may be hazardous in the long run. Also, due to less occupancy in some such colonies, the sewer lines are laid but no connection is given to the plots. They are laid to attract the buyers only.

As expected the conditions are worse in the unplanned colonies as only 18 per cent of inhabitants are satisfied with the sewerage system laid in their localities. The remaining 66 per cent and 16 per cent inhabitants of such colonies are either partially satisfied or unsatisfied respectively as no sewerage system is laid in them. These residents are relying on the septic tanks constructed by themselves on an individual basis and the disposal is done in the vacant plots.

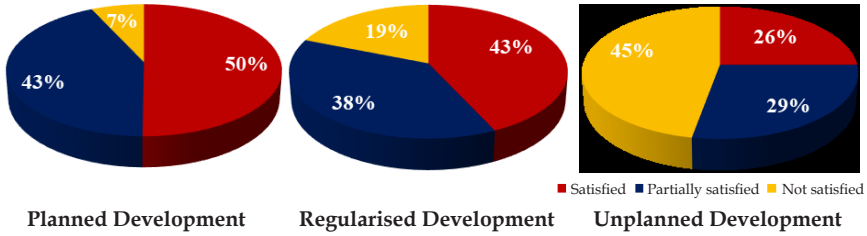
Thus, the sewerage system in 51-82 per cent of the residential colonies in the peri-urban areas of Amritsar is far from satisfactory. Sewer network is laid in some regularised and unplanned colonies just to attract the buyers. It is not working and wherever working, the sewage is disposed of untreated in the surrounding agricultural areas or vacant plots. Only the large and mega residential colonies are performing better in this field.

Solid Waste Management

The residents' satisfaction with solid waste is based on the segregation, collection, transportation, disposal, and treatment mechanism adopted by the colonizer or the public sector agency. Figure 3 reveals that about 50 per cent of the respondents of planned colonies are satisfied with the collection system of solid waste. The residents of megaprojects are fully satisfied with the household level waste segregation, daily collection system, dedicated space allotted for waste disposal, and efficient management of waste by the colonizer. The respondents of large-sized colonies are satisfied with the daily and timely waste collection mechanism managed by the developer. The residents of medium size colonies are satisfied with the waste collection managed by themselves on the monthly payment of Rs. 150/- made to the person engaged for

this activity. About 43 per cent of respondents are partially satisfied due to no role played by the colonizer and irregular collection despite paying monthly charges for managing the solid waste. The residents of small colonies are not satisfied because there is no facility for solid waste collection.

Fig. 3: Satisfaction from Solid Waste Management



Source: Field Survey December 2019 and January 2020.

About 43 per cent of respondents from regularised localities are satisfied on account of the daily collection of solid waste. About 38 per cent and 19 per cent of respondents are partially satisfied and not satisfied due to irregular waste collection and no facility of solid waste collection in their localities respectively. Other important reasons for partial or no satisfaction are the lesser number of houses and longer distance of these sites (10-15 km.) from the city, which makes it uneconomical for a private company to collect the waste. The residents use vacant plots to dump their solid waste.

About 26 per cent of respondents of the unplanned localities are satisfied with the waste due to daily collection. But 29 per cent of respondents are partially satisfied because the collection is not regular and the collection van comes at odd hours on alternate days. About 45 per cent of respondents of the unplanned localities are not satisfied because these colonies are not facilitated with solid waste collection mechanisms. Narrow zig-zag streets and roads constrain the entry of the collection van in many of these colonies. Some residents pay to the rickshaw puller dealing in the collection of waste but that too comes irregularly. Poor waste collection system chokes the drains and makes the unplanned localities hardly livable. In fact, the residents of these colonies are not willing to pay for the collection of solid waste.

Hence, it is clear that inhabitants of the mega and few large projects residents are satisfied with the waste collection mechanism. The analysis reveals that solid waste collection in the residential localities in the peri-urban area of Amritsar is based on monthly contributions in all types of colonies. The residents are satisfied or unsatisfied depending on the

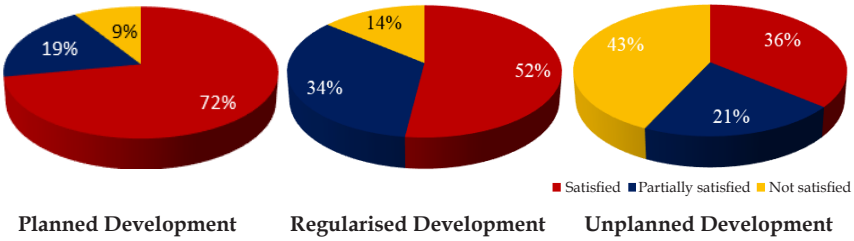
frequency of the solid waste collection van and not on the role played by the developer/colonizer.

Electricity Supply

The electricity is supplied to the peri-urban areas of Amritsar by Punjab State Power Corporation Limited. The satisfaction level of residents from electricity supply includes the supply of electricity, network and conditions of electricity wires, availability of street lights, and the lights in the park. The planned areas have the road and roadside infrastructure developed in the initial stages of their development. All the planned colonies in the peri-urban areas have the underground electricity lines within their utility corridors running along the roads. About 72 per cent of respondents are satisfied with the electricity supply in the planned colonies. The residents of the mega project are 100 percent satisfied because colonizers supply the electricity through their D.G sets during power failure. The condition of electricity lines, street lights, and distribution panels are good. The residents of the large colonies are also satisfied because the residents have their silent generators and invertors as the source of power back-up. There are no hanging wires and the roads and parks are well lighted by the street lights throughout the night. The colonies are also having solar lights as another source of electricity. About 19 per cent of residents from medium-sized colonies are partially satisfied with the facility due to shorter power break-up periods, lack of lights in the parks, lack of maintenance of street lights giving birth to a number of accidents. About nine per cent of residents of small size colonies are not satisfied although these colonies are having underground electricity lines and street lights too. The only reason for their not being satisfied is the location of transformer and hanging wires along with transformers, which may be dangerous for them and their children.

It is clear from Fig. 4 that 52 per cent of respondents of regularised colonies are satisfied with the electricity mechanism due to continued

Fig. 4: Satisfaction from Electricity Supply



Source: Field Survey December 2019 and January 2020.

electricity supply, installation of meters within the locality, right location of the distribution panel, and the availability of street lights within the locality. About 34 per cent of respondents are partially satisfied because they are facing the problem of power breakdown leading to complete darkness of streets and parks resulting in inconvenience during night time and rainy season. Also, hanging wires and the wrong location of distribution panel with regard to the surrounding land uses tend to make the residents less satisfied. About 14 per cent of respondents of the regularised colonies are not satisfied with the electricity mechanism because the street lights are haphazardly erected and some colonies do not have street lights at all.

About 36 per cent of respondents of the unplanned localities are satisfied with the electricity provisions as street lights are provided on the streets and around the parks. Nearly 21 per cent of respondents are partially satisfied because hanging wires and unplanned erection of street lights, and wrong placing of the transformer tend to create inconvenience to them. About 43 per cent of respondents in unplanned areas are not satisfied with the electricity provisions due to frequent power cuts, hanging wires at the height of 4-5 feet, poor condition of the wires and open joints of wires, etc.

Hence, the planned areas, especially the large and megaprojects and few medium planned colonies have the better management of electricity facilities, keeping note of safety and security considerations. Safety and security considerations are compromised in regularised and unplanned localities.

INFERENCES AND CONCLUSION

The magnitude of satisfaction for basic commodities, i.e. water supply, sewerage, solid waste and electricity in different types of colonies in the peri-urban areas of Amritsar clearly reveal that more than 3/4th of the residents of planned colonies are fully satisfied with the water supply facilities (refer Table 1). The remaining are partially satisfied with this facility on account of intermittent supply. No one is unsatisfied with water supply facility.

The residents of mega projects are satisfied because the developer plays an important role and provides water supply 24x7. On the contrary, the residents of small and medium colonies are partially satisfied as their developers/colonizers provide intermittent water supply only. Table 1 clearly depicts that majority (84 per cent) of the residents of regularised colonies are satisfied with their own source of water supply. While only little more than 1/4th of the residents of unplanned colonies are satisfied with the supply of water, 32 per cent

and 40 per cent are partially satisfied or unsatisfied on account of quality and quantity of water in their areas.

TABLE 1: SATISFACTION LEVEL OF RESPONDENTS IN DIFFERENT COLONIES

Type of Development	*Satisfaction Level of Residents from Basic Infrastructure*											
	Water Supply			*Sewerage*			*Solid Waste*			*Electricity*		
	Satisfied	*Partially Satisfied*	*Not Satisfied*	*Satisfied*	*Partially Satisfied*	*Not Satisfied*	*Satisfied*	*Partially Satisfied*	*Not Satisfied*	*Satisfied*	*Partially Satisfied*	*Not Satisfied*
Planned Development	74	26	0	49	21	30	50	43	7	72	19	9
Regularised Development	84	9	7	41	27	32	43	38	19	52	34	14
Unplanned Development	28	32	40	16	18	66	26	29	45	36	21	43

Source: Field Survey, December, 2019 and January, 2020.

Interestingly, more than 50 per cent of the residents of planned as well as regularised colonies are either partially satisfied or not satisfied (jointly) by the provisions of sewerage facilities in their colonies. They are not satisfied on the account of absence of main sewer pipe leading to frequent choking of sewer, no efforts by the colonizer to clean the sewer lines regularly, and disposal of the untreated sewer in the surrounding fields. Majority (84 per cent) of the residents of the unplanned colonies are not satisfied with the sewerage facility because it is not laid in their colonies (refer Table 1). Wherever it is laid, it is not operational. Hence, the untreated sewage accumulates in the open plots or in the adjoining areas of such colonies.

Similar are the conditions for solid waste management where more than fifty per cent of residents are not satisfied with this facility in planned as well as regularised colonies because collection of the waste is not done on a regular basis. About 50 per cent and 43 per cent of the inhabitants of the planned and regularised colonies respectively (refer Table 1) are satisfied as regular solid waste collection in done daily in their respective areas.

About 72 per cent of the inhabitants of planned colonies are satisfied with the electricity provisions. The remaining are partially satisfied or not satisfied on account of irregular supply of electricity and unsafe open connections and location of transformers. About 52 per cent and 36 per cent residents of regularised and unplanned colonies respectively (refer

Table 1) are satisfied with the electricity provisions. But 48 per cent and 64 per cent residents of regularised and unplanned colonies respectively are partially satisfied or not satisfied on account of irregular supply of electricity and unsafe open connections.

Thus, the peri-urban areas of Amritsar are characterised with planned, regularised and unplanned residential developments. The perception that planned residential colonies are provided with good infrastructure to meet the expectations of their inhabitants is proved to be partial in the case of Amritsar peri-urban areas. Except for few mega or large residential projects, the condition of the infrastructure is nearly similar to the regularised colonies. Neither the private developers in planned colonies nor the government in regularised or unplanned development have extended support to improve the quality of life of their residents. Although the government receives charges/ fees from the colonizers of planned colonies or to regularize the colony but still the colonies face infrastructural deficiencies leading to the dis-satisfaction of the residents. The goodness or excellence of infrastructure of mega and large projects is on the account that HIG/ MIG income group own the houses in these localities. They are able to pay monthly charges to avail better infrastructural facilities.

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