



Unsustainable Environment and Prevalence of Diseases in Urban Slums: A Case of Bahawalpur, Pakistan

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Abstract

There is a general consensus that poverty is a major cause of environment degradation. Based on the urban slums of Bahawalpur City, this article is a case study about the analysis of the relationship between various economic, social and environmental factors, and their impacts on the health of local population in the form of different diseases. Main objective of this study is the formulation of a sustainable approach by which environmental degraders of slums can be converted into environmental activists. This research is carried out on descriptive study design while primary data was collected from field survey. Firstly, this paper identifies web of interrelated factors which are responsible for the adverse environment of slums mainly due to low income status, high dependency rate, illiteracy, poor housing condition, lack of governance and environmental unawareness. Secondly, based upon the data analysis, this paper also addresses the major adverse impacts of these factors on the health of slums dwellers through the prevalence of diseases. Typhoid fever, diarrhea, influenza, malaria, cholera and hepatitis A and B are found to be the main health issues of these slums. Incidence of these diseases within different age and sex groups is also considered. Based upon these results, hypothesis is generated that environmental and socio economic conditions are the main reason of these diseases. Finally this study leads the authors to suggest some community based activities which will engage the local dwellers in changing the degraded environment to sustainable environment and hence minimize the health threats they are facing presently.

Keywords: Unsustainable environment, disease, slums, community engagement.

Introduction

The key to man's health lies largely in his environment. In fact much of man's ill health can be traced to adverse environmental factors such as water pollution, air pollution, poor housing conditions and insect vectors of diseases which poses a constant threat to man's health¹. According to Rio Declaration and Agenda 21, 1992, human health is considered as the fundamental aspect of sustainable development².

The populations most vulnerable to environmental insults are those with fewer resources, older technology, and more compromised health, and yet research and interventions are not always focused on these populations³. Worldwide, poorer residents of large cities bear the brunt of the adverse health consequences of environmental degradation⁴.

Environmental health is defined by the World Health Organization as, "Those aspects of the human health and disease that are determined by factors in the environment. It also refers to the theory and practice of assessing and controlling factors in the environment that can potentially affect health"⁵. The strict definition of environmental causes of diseases would all those that are not genetic. The different environmental health threats can be divided into "traditional hazards, which are associated with lack of development, and the "modern hazards," which are associated with unsustainable development⁶.

Pakistan is a developing country with total population of 175.51 million and growth rate of 1.9 per year⁷. Environment challenges and issues of Pakistan are associated primarily with an imbalanced social and economic development in recent decades. This challenge is further compounded with rapid urbanization due to a shift of population from rural to urban areas. Thus, all major cities of Pakistan face haphazard, unplanned expansion leading to increase in pollution. Ultimately this unchecked growth has led to creation of slum areas around city peripheries and low lying area. Slums are typically characterized, in part, by the lack of access to clean water and exposure to unsanitary conditions with excrement and open sewage pooling along unpaved walkways⁸. The total population of Bahawalpur district was 2,433,091 as enumerated in March 1998 with an intercensal percentage increase of 67.4 since March, 1981 when it was 1, 4538 souls. The average annual growth rate was 3.07 percent during this period. The total area of district is 24,830 square kilometers which gives population density of 98 persons per square kilometers as against 59 persons observed in 1981 including fast growth rate of district⁹.

Under the present scenario, the managers of Pakistan's major urban centers are facing rising difficulties in developing their management plans to provide adequate water and sanitation facilities and health services to ensure a healthy living environment in such areas. Thus, environmental degradation is fundamentally linked to poverty in Pakistan, which is the main

impediment in dealing with the environment related problems especially health. This environment poverty nexus cannot be ignored if effective and practical solutions to remedy environmental hazards are to be taken. The global importance of water, sanitation and hygiene for development, poverty reduction and health is reflected in the United Nations Millennium Declaration, in particular its eight Millennium Development Goals, in the reports of the United Nations Commission on Sustainable Development and at many international forums¹⁰.

The main objective of this paper is to analyze the environmental health risks factors and their resultant diseases. On the basis of which, a set of community engagement strategies were designed to attain the sustainable development in the slum areas of Bahawalpur City as shown in figure-1. According to Chavis¹¹, Community Engagement is a major method for improving the quality of the physical environment, enhancing services, preventing crime, and improving social conditions. Furthermore, Florin¹² identifies the evidence that participation can lead to improvements in neighborhood and community and stronger interpersonal relationships and social fabric.

Material and Methods

This cross sectional study was conducted during period of February- April 2010 in the five major slums of Bahawalpur City showing in figure-2. For this descriptive study population of all ages were taken from the representative areas. A random sample of almost 250 households was taken from each slum, whereas the average number of household ranges between 500-600 houses. Primary data was collected through field survey, observation and interviews with the slum dwellers while the secondary data obtained from health care center and Tehsil Municipal Authority (TMA).

Pacione is of the view that the various forms of poor-quality housing in developing countries share a number of characteristics that contribute to poor environmental health. The first of this is the lack of safe and sufficient water supply. The second is the presence of pathogens or pollutants in the human environment because of a lack of basic infrastructure such as sewers, drains or services to collect and safely dispose of solid and liquid waste. The third is the overcrowded living conditions, which increase the transmission of airborne infections as well as the risk of domestic accidents¹³.

Therefore, for current study, socio economic conditions, housing conditions, sanitation, waste water and solid waste disposal, low nutrition level, and water quality were considered as environmental health risk factors. Dependency ratio and total household income per month was calculated to check the economic status of population, while questions relating to the area of house, number of rooms, building material, and house repairing rate were asked to check the housing condition. Housing structure was divided into two categories i.e. "Kaccha" (Local word used if the building material was mud, grass, wood or tin) and "Pakka" (Local word used if the building material

was bricks and cement with the concrete roof). House hold density (crowding) was obtained by dividing the total area of the house by the number of people living in the house. Questions relating to sanitation conditions were asked as if they had attached or separated latrines, similarly how do they deal with their waste water (sewage pipe, pit drainage, open drain, or other) and solid waste (Tehsil Municipal Authority container, streets, and dump at open place or other). Nutrition level was estimated by the frequency of meal intake (one time/ two times/ three times per day). Furthermore water samples from the representative site were tested from the PCRWR (Pakistan Council of Research in Water Resources, Bahawalpur) laboratory for the analysis of drinking quality. Some questions were directly asked during field survey about the sources of water (municipal water supply, hand pump, electric pump or other), similarly whether they filter or purify that water or not.

Second part of the questionnaire is entirely related with the incidence of major disease with reference to their age groups. Diseases were generalized into Respiratory diseases (Tuberculosis, Asthma, Influenza and Emphysema), Digestive diseases (Cholera, dysentery, Diarrhea, hepatitis B-C, Dehydration Gastro enteric), skin diseases, Cardiovascular, Diabetes, hypertension and some other epidemics like Malaria.

This study has several limitations of different nature which may affect the accuracy of analysis. The main problem that has been faced is the illiteracy of the people; they seemed to be reluctant to give information about their family members, income level, land holdings and diseases they were suffered, in fact most of the people did not go for their medical checkup therefore they were unaware of the actual disease they suffered. Although it is difficult to establish a cause-effect relationship in this cross sectional study but it identifies the clear relationship between some diseases and the unsustainable environmental condition of the area.

Results and Discussion

Sustainable development is concerned with balancing environmental, social, and economic objectives in order to maximize societal wellbeing, both now and in the future. On the basis of this criterion, the analysis of slums of Bahawalpur show highly unsustainable environmental conditions. The adequacy of housing is an important determinant of health status, in a number of ways. Housing quality effects levels of exposure to indoor pollutants, food and water hygiene, levels of sanitation, exposures to physical hazards and injury and general quality of life¹⁴. Housing condition of slums in study area is highly unsafe because of dangerous construction as 70 percent of houses are of "Kaccha" category making them prone to various environmental health risks which are mentioned by figure-2. Most of the houses are overcrowded with average room density of 5 persons/room and average total area of just 126.5 square meters. Moreover 75 percent of houses are without courtyard and 65 percent; without appropriate ventilation in their houses. Though the age of houses is not very old but the maintenance rate is as low as 10 years.

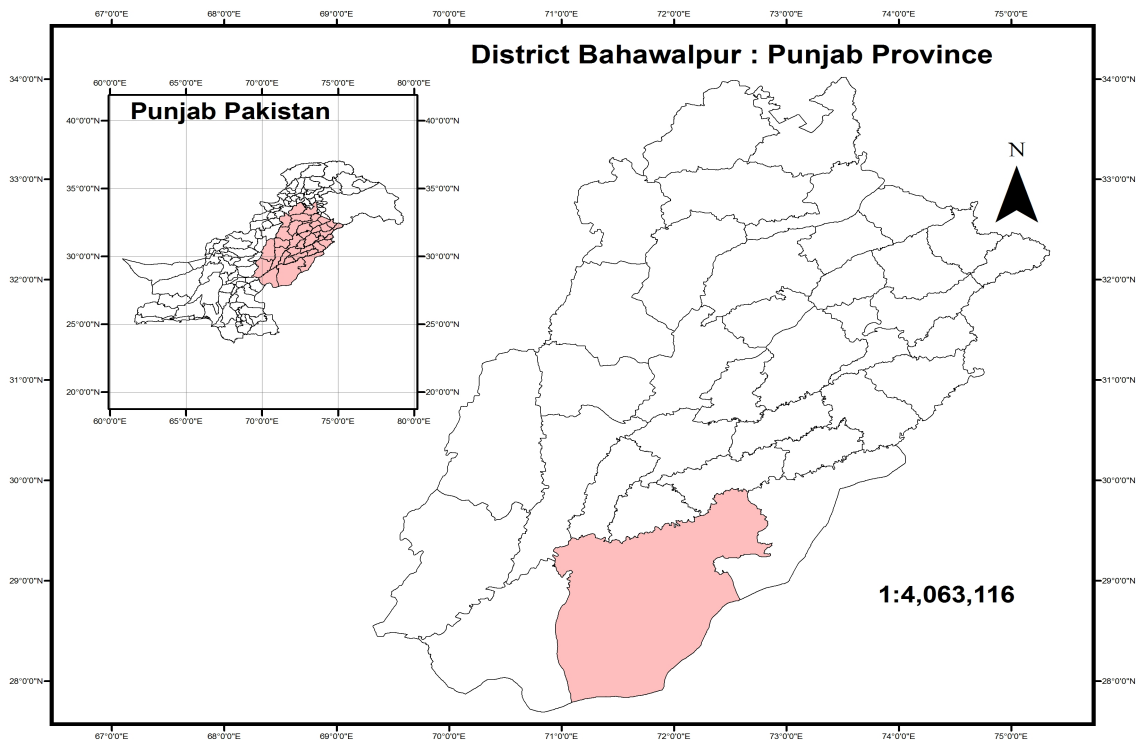


Figure - 1
Location of Study Area

Major slums of Bahawalpur

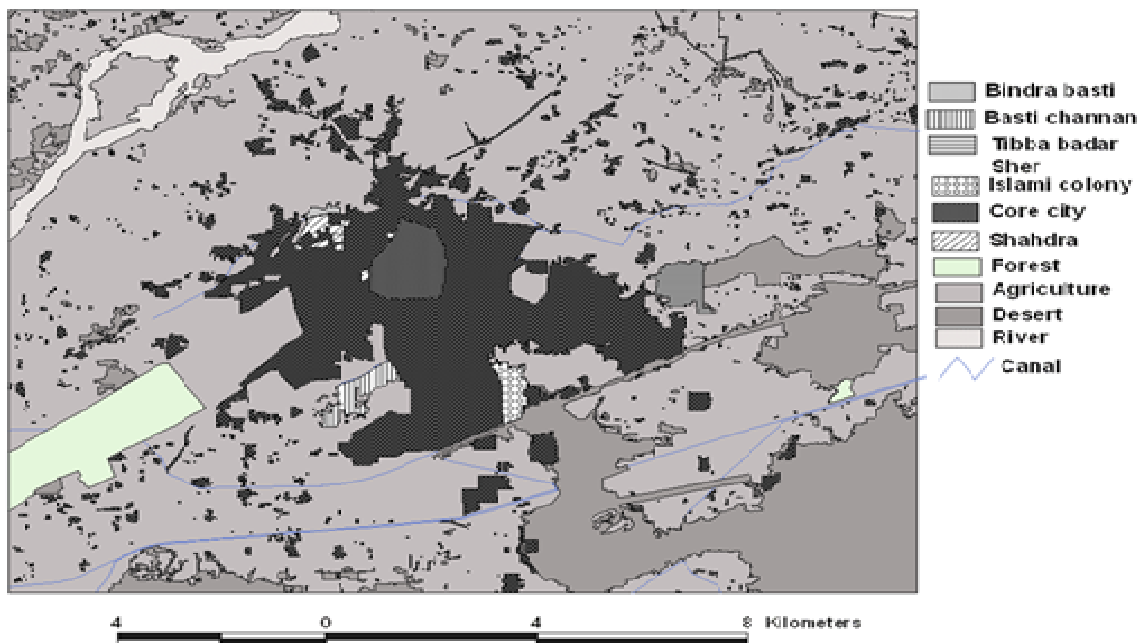


Figure - 2
Slums under Study

Among the social determinants, average family size is 7 persons/household, which is also one of the causes of illiteracy among slum dwellers as head of family is economically unable to afford the expenditures of education, which is well indicated by the 76% illiterate population while the remaining are mostly primary educated showed by figure-3. Because in larger families a mother cannot give as much attention to the minor ailments of each child and other member of houses¹⁵ thus socially this determinant leads to the ignorant generations who would become environmental degraders. Similarly there is no formal health care center or hospital in the neighborhood of slums; they have to go to the main general

hospital of Bahawalpur city but that is in appropriate distance of almost 10-15 Km from all slums.

Among the economic conditions, the income level of slum dwellers is as low as PKR 9000/month/household to manage even the basic needs of human life, impaired with high dependency rate of 72 percent as shown in figure-3. Majority of the employed population are laborers in factories and construction sector on daily wages showing their unsecure occupation. Nutrition level is also very low in study area i.e. more than 40 percent household take one meal/day as shown in figure-4.

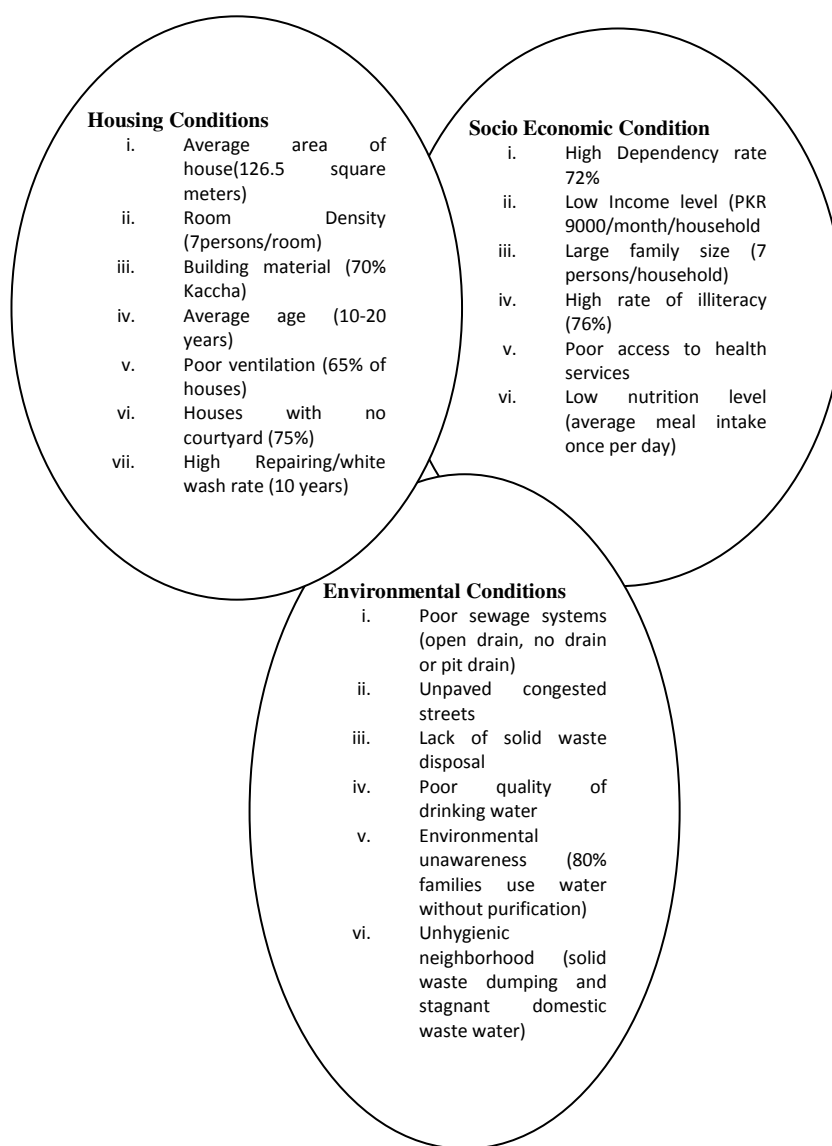


Figure-3
Socio Economic Profile of Study Area

Apart from low economic conditions, improper sewerage system is the sign of sever environmental degradation in these areas. People use open drains to drain wastewater from their houses into open main holes and pits, which is the dominant risk factor to the health of slum dwellers. Streets were mainly unpaved and uneven. Open spaces have become dumping points of solid wastes of houses, rain water and waste water stagnant in those grounds causing ill smell, unhygienic environmental conditions which may cause many vector borne

diseases like Malaria. Availability of clean water is going to be the greatest constraint for human health¹⁶⁻¹⁹. Electric pump is the main source of drinking water mentioned by figure-5, while the laboratory analysis of water samples from representative slums, show poor quality according to World Health Organization standards table-1. Moreover people use water without any processing, because of their unawareness and illiteracy as explained in figure-3.

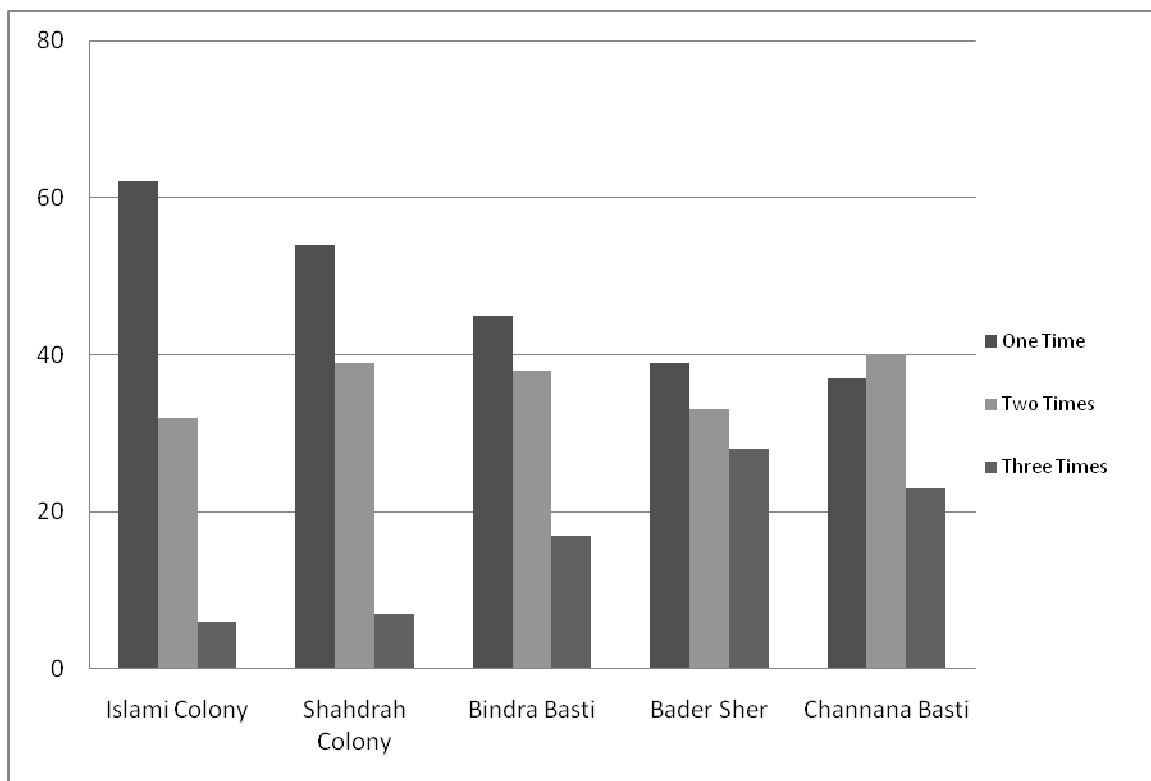


Figure-4
 Meal Intake among the Slum Dwellers

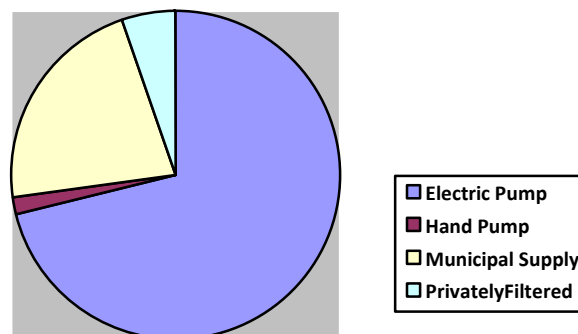


Figure-5
 Drinking Water Sources in Slums of Bahawalpur City

In addition, these slums indicate the negligence of local government as there has been no slum up gradation policies yet designed for these areas. In such way, slum dwellers both contribute to and are victims of urban pollution and health threats. High population densities and unregulated urban growth combined with a lack of environmental services, lead slum residents to further contribute to the poor environmental quality of informal settlements. The environmental risks of these settlements perpetuate the cycle of urban environmental degradation and contribute to greater economic and environmental vulnerability, both for low-income households and the urban area at large. Thus, these people are deprived of resources to escape the situation.

When studying the spread of disease, it is important to examine a multitude of factors, including the overall population that is impacted by a particular disease, the environmental context in which that disease is spreading, and the social behaviors or practices that might intensify or mitigate the diffusion of a particular disease. Poor social and economic circumstances affect health throughout life²⁰. The result of this study indicates a clear relationship of many diseases with unsustainable environment and socio economic conditions. Different diseases show different percentage among age groups, as susceptibility toward disease varies with the ages shown by table -2.

Table-1
Water Quality Report of Urban Slums, Bahawalpur City

Sr. No.	Water Quality Perimeters	Permissible Limit	Slums of Bahawalpur City				
			Islami Colony	Shahdrah Colony	Bindra Basti	Tibba Badar Sher	Channan Basti
1	Color	Colorless	Colorless	Colorless	Colorless	Colorless	Colorless
2	Hardness (mg/l)	500 (WHO)	190-330	265-285	340	240	1150
3	TDS (mg/l)	1000 (WHO)	290-595	401-429	579	1048	3665
4	pH	6.5-8.5 (WHO)	7.2-7.35	7.4-7.35	8.3	8.5	8.4
5	Alkalinity	NGVS (No Guideline value set)	4.5-6.4	3.2-3.6	4.4	6.4	8.4
6	Bicarbonate (mg/l)	NGVS	225-320	180-160	220	320	420
7	Chloride (mg/l)	250 (WHO)	16-66	51-88	115	221	403
8	Sodium (mg/l)	200 (WHO)	36-93	33-28	48	357	620
9	Potassium (mg/l)	12 (EC)	7.5-5.2	5.5-5.2	6.7	12.8	130
10	Calcium (mg/l)	200 (WHO)	36-6	58-84	48	56	192
11	Magnesium (mg/l)	150 (WHO)	26-40	29-18	53	24	163
12	Sulphate (mg/l)	250 (WHO)	33-106	72-86	49	457	1800
13	Nitrate (mg/l)	10 (WHO)	0.07-0.17	0.02-0.03	0.02	0.04	12.32

Source : PCRWR Bahawalpur

Table-2
Disease Incidence among Slum Dwellers

Major Diseases and their percentage among different age groups in the Slums of Bahawalpur				
Sr. No	Major Diseases	Young (1-14)	Adults (15-60)	Aged (60 and above)
1	Typhoid Fever	15	02	08
2	Diarrhea	13	03	04
3	Influenza	17	01	09
4	Cholera	12	02	00
5	Malaria	33	03	03
6	Hepatitis B-C	03	10	09
7	Hypertension	00	44	06
8	Cardiovascular Disease	00	21	22
9	Anemia	04	05	11
10	Tuberculosis/Asthma	02	06	19
11	Others	02	03	09

Source: Field Survey of the slums of Bahawalpur February-April 2010

Major diseases which are found in slums of Bahawalpur are, typhoid fever, diarrhea, influenza, cholera, malaria, hepatitis B-C, hypertension, cardiovascular diseases, anemia, tuberculosis, and some others like diabetes, skin problems etc. Infection diseases dominate among children, constituting Malaria (33%), Influenza (17%), typhoid fever (15%), Diarrhea (13%) and Cholera (12%), reason of which is the low immunity, lack of sanitation and because children are the favorable hosts for the prevalence of communicable diseases. Hypertension is the primary disease found in 44 percent of adult population along with 21 percent Cardiovascular, and 10 percent Hepatitis. Diseases of aged people, swings between tuberculosis, cardiovascular and hepatitis which can be seen in table-2. The reason of high malarial rate among young observed peak incidence in study area during July-September constitutes rainy season which leads mosquito breeding. It is also triggered because of sub-standard condition of water supply, poor hygiene and sanitation of the area.

In every slum the diseases prevalence is different among Male and Female because these two groups having their own physical characteristics i.e. appearance, food intake capacity, immunization level and health status. High rate of Anemia is observed in female population as compared to males, reason of which is the low nutrition level and poor maternal health in the study area. Similarly Asthma, Diabetes, and Hepatitis B-C dominates in male population depicted by figure-6, because of their prime occupation type (factory workers), negligence of health and environmental degradation respectively.

Thus, it is observed that the proportion of different diseases in different age groups is varying. Young people observed more susceptible toward diseases like typhoid fever, malaria, influenza, cholera etc. while adults seemed to be more effected by the socio economic stress then the environmental risks, because of two reasons, first that they have strong immune then

the young and aged and second that they are suffering more from economic dependency.

Creating Sustainable Healthy Environment: Slum upgrading consists of physical, social, economic, and environmental improvements that are done in partnership with citizens, community groups, government, and local authorities. These improvements often focus on introducing or improving basic service provision, mitigating environmental hazards, regularizing security of tenure, providing incentives for community management and maintenance, and improving access to health care and education^{21,22}. Changes in public policies, as well as changes in individual behaviors, are needed to achieve reduction of environmental health hazards²³.

The principle objective of this paper is, to minimize the environmental threats through awareness at community level and their engagement for improving local environment thus putting theory into practice, framework of which can be seen in figure-7. Community engagement of slum dwellers in the improving and maintaining environmental health is an economic step as it involves in utilizing the local people and resources. Therefore, the main methods for addressing these issues can be including; i. Development of the degraded environment cause and effect framework (including driving forces, pressure, state, exposure and effect) for the specific slum communities (e.g. urban slums) through field surveys. ii. Recruiting volunteers or members from the representative slum communities, iii. Develop a campaign plan for target communities, iv. Promotion of awareness raising activities throughout the communities which includes, public training, meetings, preparation and distribution of environmental education resource material, communicating environmental health messages through mass media, distributing brochures focusing environmental health risk awareness.

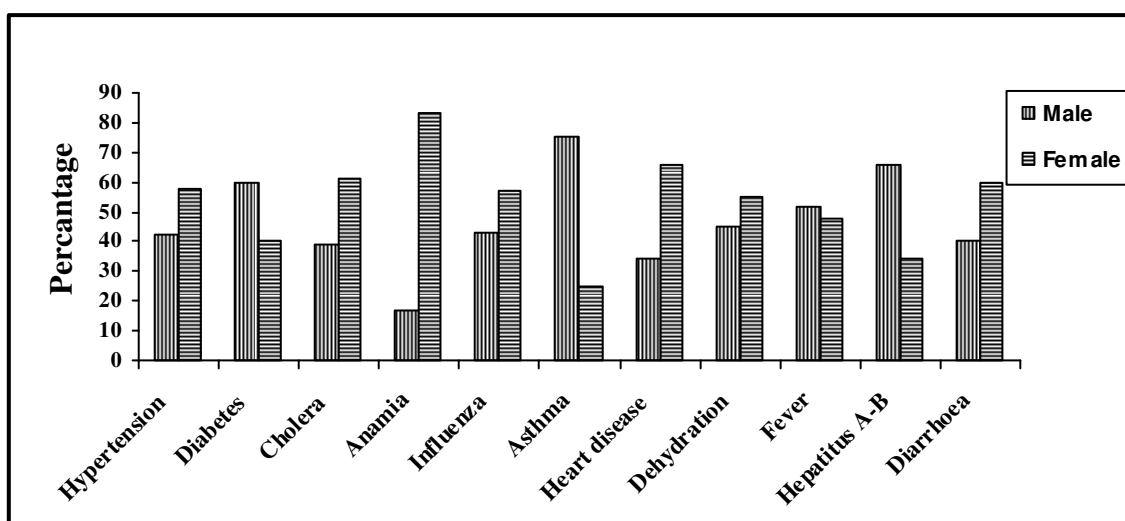


Figure-6
 Gender Differences in Disease Incidence

Human and financial resources are required to complete such type of initiatives in these communities which depends on the area and population under consideration. The limiting agents for the implementation of these projects can be; i. Illiteracy among slum dwellers, ii. Lack of background knowledge of environment among them, iii. Lack of volunteerism among slum dwellers because of economic problems, iv. Insufficient national and local development especially for sanitation.

had failed to accommodate the poor people, so they have been forced to live in the marginal parts of the city, leading the development of slums in Bahawalpur. These areas lack infrastructure and urban services along with the degraded local environment which is the product of illiteracy and unawareness, consequently the slum dwellers are facing health risk and threats. City administration had failed to solve these issues, because of mal attention and lack of resources. In such condition, one of the best mitigation strategies is the “Community Engagement” which is based on the people involvement in improving the quality of environment in sustainable way.

Conclusion

Like many other cities of Pakistan, Bahawalpur City has grown very rapidly the last few years. As a consequence of which city

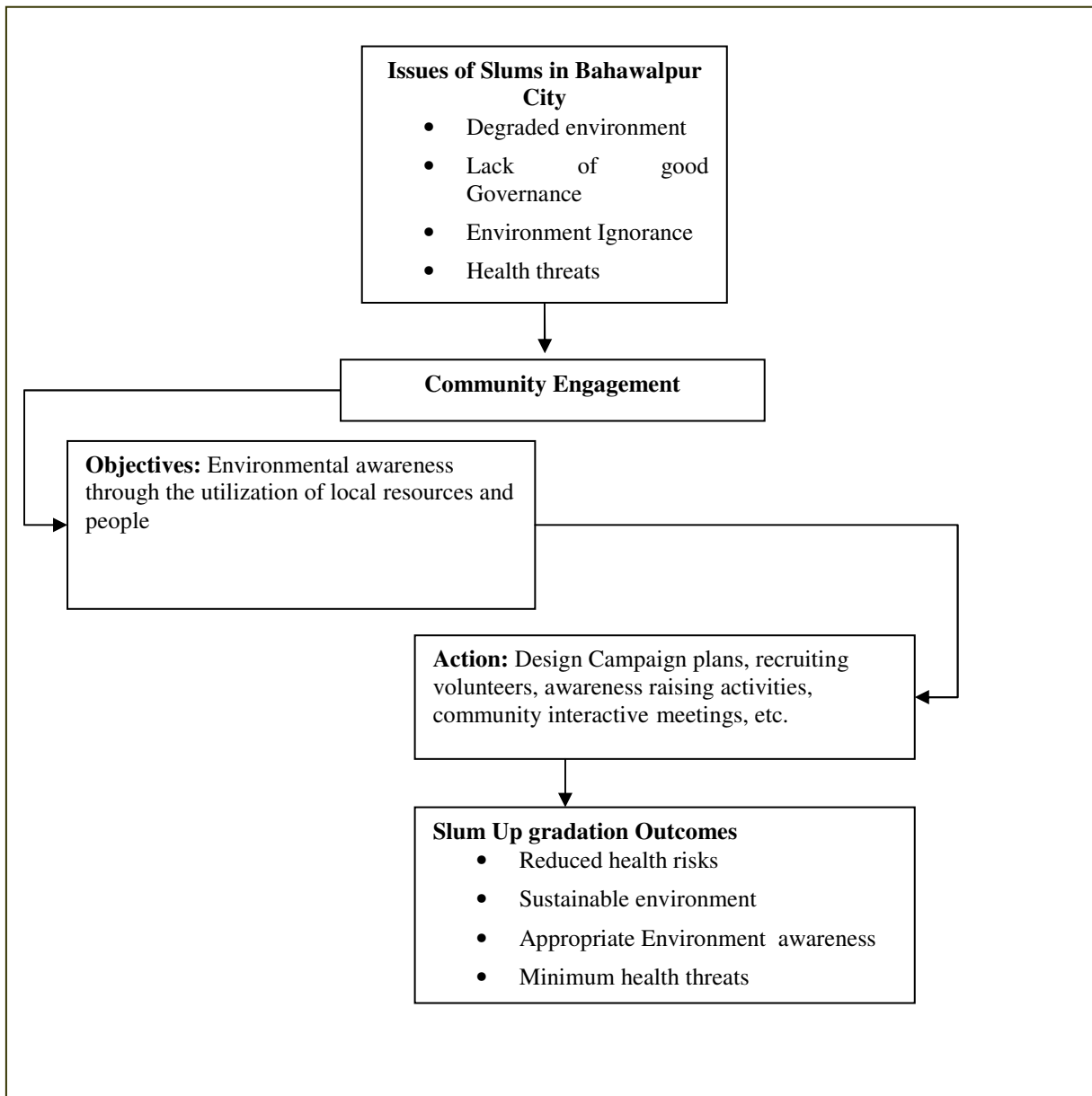


Figure-7
Strategic Plan for Healthy Environment

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