Multiple Stakeholders Role in Sustainable Water Sanitation and Hygiene Development in South Asia Region

(A Case Study from Lahore Pakistan)

Muhammad Wasif Bashir Babar [(1)]
[(1)]*President of Pakistan Youth Parliament for Water (PYPW)*
Master of Science (MS) Sustainable Water sanitation Health & Development
COMSATS Institute of Information & Technology Abbottabad
Home Address: Muza Thatha Baig, Chack Mubarakwala, Tehsil & Post Office Tandlianwala, District Faisalabad-Punjab Pakistan
Email: wasifbashir15@gmail.com
Contact: +923007913418

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Abstract: *This study was conducted in March 2016 with prime objective to investigate WASH issues and the process of multiple stakeholders' involvement & impact of WASH development on human life. Primary & Secondary data was collected & analyzed using percentages and frequency distribution using SPSS. Results indicated that local community associated with very low socioeconomic, health & education status and facing huge WASH related issues due to poor management. Local Government, civil society, women, youth, teachers and the wider community join hands and have developed sustainable WASH Infrastructure. The study concludes that multi-stakeholder involvement is needed to ensure ownership of Project to local community and sustainability of WASH Development.*

1. Introduction & Background

This study was conducted in March 2016 in the local community of Lahore Pakistan named "Badar Colony" where people were facing poor drinking water, sanitation and hygienic conditions, and environmental hazards. Badar colony Union Council 60 is situated near Ranger Headquarters Lahore and it comes under the jurisdiction of the Aziz Bhati Town Water, Sanitation Agency (WASA) Lahore. The Majority of people in this area has migrated from other cities of the Punjab and other provinces. This area had very little legal status and people of the Badar Colony have not been issued registry of ownership of property and Land. People of this area were very poor and have very low socio-economic status. The majority of the people were uneducated. People of different socio-cultural background reside in this area and therefore have very low social cohesion.

Figure 1.Geographical Area of Intervention

2. Objectives

This study was carried out with the prime objectives to

- access the fundamental WASH issues of the local community
- determine the process of multiple stakeholders involvement
- analyze the impact of WASH development on human life

3. Method

Aziz Bhatti town was selected as universe in which the study conducted & Badar Colony as population while three sub-towns (hamlets) selected as a target population. A well-structured household Questionnaire developed and interview scheduled during the survey in hamlets of local community, focus group discussion (FGSs) and personal observation techniques were used for primary data collection while secondary data was collected from published reports. A total of 450 households were selected as a representative sample size & interviewed using a probability random sampling technique in which 150 household were selected from each hamlet. A total of 120 Focus groups (FGD) were conducted with equal gender & geographical representation with 40 focus group discussion conducted in each hamlet. Personal observations were carried out during field visits throughout the study period. Data was analyzed using Statistical

Packages for Social Sciences (SPSS) and result presented & discussed on the bases of Descriptive statistics was used to analyse the data. All the collected data putted into the Statistical Package of Social Sciences (SPSS) software and analysed based on the Frequency distribution and percentage of the responses collected from local community during interviews.

4. Results & Discussion

4.1 WASH Situation before the Project

Ground water was the only source of drinking water and was totally contaminated due to the poor sanitation system and solid waste management. Sanitation conditions of the study area were poor and people were facing sanitation Poverty. Almost all the households have latrine at their household but there were much diversity in the latrine construction and its existing conditions. 83% have latrines without walls and roof but having a curtain for the privacy whereas 15% have latrines with constructed walls but without roof and almost 2% simply have dug a hole in the ground and after the defecation cover it with plastic sheet. These figures are indicative of the socio-economic status of the community.

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4.1.1 Types of Sanitation before Scheme

There were different types of sanitation being practiced in the study area before the project intervention in which [1]drop and store, [2]flush and forget and [3]flush and discharge were commonly practiced. [1]Drop and store is a sanitation system where people dig an underground septic tank for defecation and store all the black water including faeces and urine (WHO / UNICEF, 2013) in that tank. [2]Flush and forget was also a sanitation type where people use to flush black water outside from toilet with a pipe or open hole and then forget about where its went. [3]When people flush black water into the drainage line either open or covered, the system is called flush and discharge.

Almost 68.3% population practiced drop and store in which they dig a well about 23-35 feet depth where they store black water including faeces and urine. Due to this poor knowledge about sanitation; ground water severally (UNICEF, 2012) contaminated and become not fit for domestic purpose. Almost 28.3% use flush and discharge systems in which they flush black water (toilet water) to open drain lines that lead this wastewater to other places. This system was also very harmful for the local community health (UNICEF/WHO, 2012) and environment. while a few number of household use flush and forget type of sanitation in which people just flush the black water out of their household without caring where it goes, this also put very negative impact on the health and (WHO, 2012) environment of local people.

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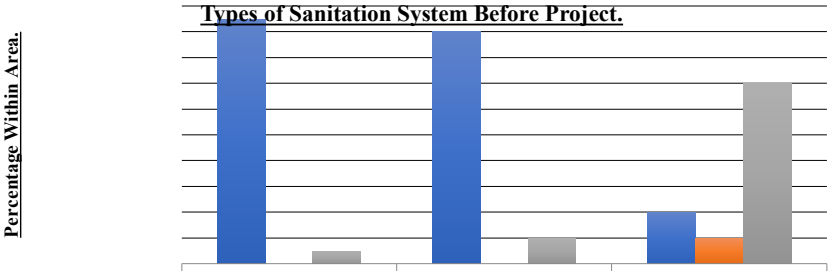
Almost 95% Population of Badar Colony practiced Drop and Store and 5% flush and discharge while in Dogach Town 90% household used Drop and Store and 10% Flush and discharge but in Jalal Park a very mixed sanitation systems were used. Jalal park situated on the main road and has an open drainage line surrounding its locality so in that area almost 70% household practice flush and discharge while 10% flush and forget , 20% drop and store sanitation system.



	Badar Colony	Dogach Town	Jalal Park
Drop & Store	95%	90%	20%
Flush & Forget	0%	0%	10%
Flush & Discharge	5%	10%	70%

Figure 2.Sanitation System in Selected Areas

Drop and store type of sanitation system severely impact the economic and health status of the community. Ground water level varies from from 75-120 feet. People of this community dug wells which they use to store black water (feaces and urine) and depth of these dug wells also vary from one household to another depending on the economic strength of the household, but its minimum depth was 15 and maximum 25 feet with 5-7 feet dia. People have to pay 10,000 to 15,000 Pakistani Rupees which almost equal to100 to 150 USD for digging a new well (Gutter/Gherki) and when it is filled they have to clean it and pay almost 5000-8000 Rupees for emptying it which put extra (Ahmad, 2011) economic burden on the household.

Drop and store sanitation system also drastically impact the socio-economic, health, environment, and education condition and it is also (Hubbard and Sarisky, 2011) a great loss of rich nutrients. Black water seepage into soil and make it poisonous at when it mixes with and contaminates the fresh ground water. Some people have installed motor pumps for the extractin of water at a depth of75-100 feet quite near to their washroom and they pump up the contaminated ground water which is not palatable and potable. Mos people use water from motor pumps which are contaminated and this severely impact (Thomsen, 2007) the health of the community. It also lost the natural nutrients which are totally against the ecological sanitation (Ferroni and Castle, 2011) system.

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4.1.2 Community Satisfaction with Sanitation system before project Intervention

Ground water was fully contaminated and it increased the prevalence of water born disease in the area which put severed effects on the human health..A maximum, portion of the public income spent over the treatment of these diseases which put bad impact on the socio-economic status of the local community. Due to the poor sanitation and solid waste management directly affected the environmental and increased the ecological hazardous. As there was not good condition of the streets of community and in the rainy season as well as open flow of the waste water restrict children to ensure the 100% attendance in schools which also put sever impact on the educational status of local (Carter et al., 1999) community. Almost 79% population were totally dissatisfied with the sanitation services within Badar colony, highest at Jalal Park with 85% and 80% compared to Dogach town with 70%.

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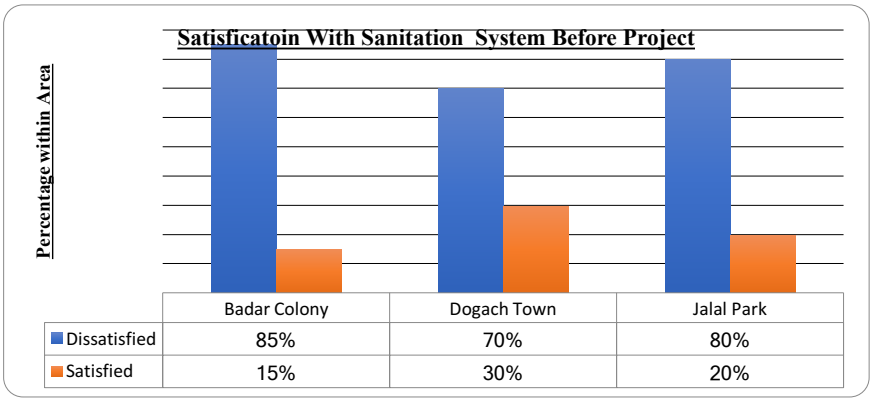

Figure 3. Community Satisfaction with Sanitation System before Intervention

Just 21% of the population was satisfied with the sanitation service before the project.

4.1.3 Community Satisfaction with Drinking Water Quality before Project

Ground water was used for domestic purposes which were highly contaminated by disease causing agents (Thippasouda, 2008). Almost 78.3 % were dissatisfied with the quality of ground water and believe it to be ia disease causing mediator. The population of Badar Colony, Jalal Park and Dogach Town showed 90%, 70% and 75% dissatisfaction respectively. Almost 21.7 % populations was satisfied with the ground water, 30% at Jalal Park, 25% at Dogach Town and 10% at Badar Colony.

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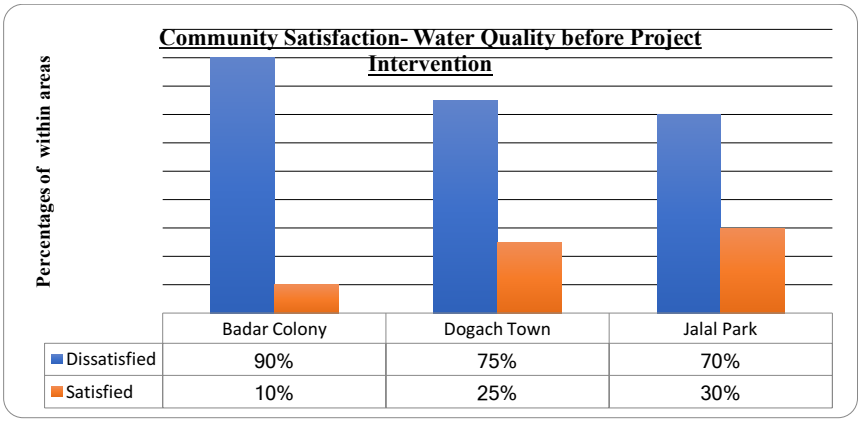

Figure 4. Community Satisfaction with Drinking Water Quality before Project

Ground water quality depended on the depth of the boring of motor pump, the deeper of boring the lesser the contamination of the wastewater. Motor pump sucked up water from the deep aquifer which mostly ensured the purity and potable of the drinking water. But installation of motor pump near the deep dug wells increased the rate of contamination and make the ground water fatal (Water Aid, 2011) for the human health due to microbial contamination in result of black water mixing with ground water.

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4.2 Multiple Stakeholder Inclusion process

Government of Punjab took initiative to provide Safe WASH services to poor marginalized community of Badar Colony on public private partnership (PPP) doctrine using Bottom-Up approach and Component Sharing Model (CSM) philosophy. This project was developed on Component sharing Model of Development in which responsibilities divided and put forwarded at household level to stakeholders as a (Welle and Walnycki, 2012) bottom –up development approach. In component sharing model project divided into two major components, one External and other one called Internal Component. External Component involved installation of main water supply and sanitation lines, linked , sub-main, tube well with 700 feet depth, Overhead Water Reservoir (OHR) having capacity of 50 thousand gallons , disposal station for the waste water treatment and electricity transformer for power connections.

All the infrastructures of External Component was designed, plan, funded and developed by Water and Sanitation Agency (WASA) Lahore with coordination of Urban Unit Planning and Development (P&D) Department Govt of Punjab. Internal Component was developed by the community on self-help bases. Community was responsible for the collection of

money, installation of water supply pipeline of 3-4 inch dia and sewerage pipeline having 9 inch dia , household WATSAN connection and installation of Water meter .

4.3 Community Stakeholders inclusion with Social Mobilization

A civil society named “Anjuman Samaji Bahbood (ASB) played its role for the social mobilization and engaging them in the developing sustainable water supply, sanitation infrastructure in the community on self help bases. Water supply and sanitation committees developed at street level in which women, men, youth were equally engaged. Same like street community committees there were a town committee while the street committees were majorly responsible for the collection of money from each household of the street and submit it to the Village committee. A local Water and Sanitation Community Committee (WASCO) was formulated and all the money usually submitted at that office for the installation of the WATSAN Piping networks in the respective streets.

4.3.1 Women WASH Development Leaders (WWSHDL)

Engaging women in the WASH development activities is major concern of the development actor’s organization and donor agencies in the world. Women considered a key of change makers in the life style of human nature (WaterAid, 2012). Women engaged equally in all the phases of WASH development activities and concerned their issues regarding WASH services. Women provided equal chance of playing their roles in the development of this scheme. All the matters discussed, judged and resolved with Gender equity and equality manners. Women were members of Street’s, Mohala’s WASH Committees.

Women played very active role in the social mobilization of community in participation, collection of money and solve their issues self on local level regarding water and sanitation in their own areas. They mobilized their husbands for paying money, participate in project development, and maintain hygienic condition of household (Castro, 2007) streets and environment of the area. Women Water, Sanitation and Hygiene Development Committee also established in all the mohalas which was excluded from other Mohala WASH Committees. They played same role of Mohala WASH Committees and after each week the progress of both Man and Women committees compared and competing team got appreciation from Development Actors agencies.

4.3.2 Equally Financial Contribution and WASCO Responsibilities

Each household pay equally almost 6200 Pakistani Rupees (62USD) for the installation of WATSAN Pipelines and getting the water supply connection and sewerage services inclusively. Local youth were also engaged for the better monitoring of development phase that usually played their role in the social mobilization, social mapping, networking, and awareness rising among the community about the benefits of safe WASH and worst impacts of Poor WASH. Water Supply and Sanitation Community Organization (WASCO) was developed by local community based on the local representative. It was responsible

for ensuring 100% community participation with Zero subsidy/ free/ illegal WATSAN connection. The prime responsibility of WASCO was ensuring transparency in financial management, 100% provision of WATSAN Services in the area, Provision of Water supply on 24/7 philosophy , community 's Complaint resort and resolution, (Lee, 2013) and protect community environment (Willoughby, 2013) maintain project sustainability .

4.3.3 Water Supply intervention in the Local Community

A systematic Safe underground Water supply & sanitation piping network installed and drinking water pumped out and stored in the overhead reservoir. It supplied through gravity flow to each household .A tube well with 700 feet depth and an Overhead Reservoir (OHR) with 50 thousand gallons storage capacity were developed to ensure water supply on 24/7 days with water metering and gravity flow. Water was supplied through piping at house step. People took water supply connections from the water pipelines which were installed in their street.

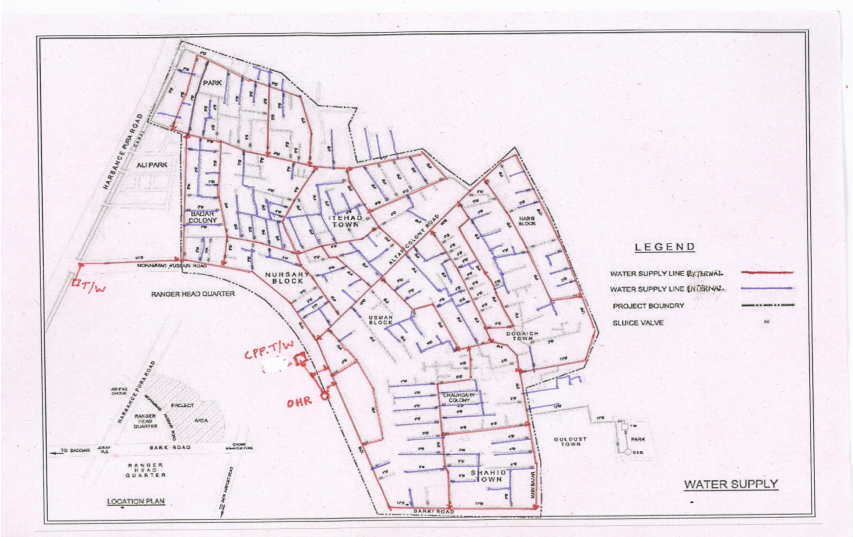
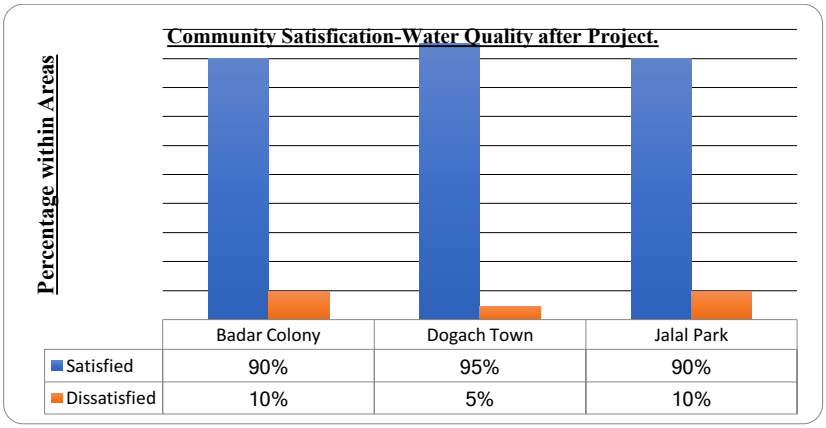


Figure 5.Map of Water Supply Pipe Lines Installed

4.3.4 Community Satisfaction with Water Quality after Intervention

Drinking water sucked out from 700 feet depth and was supplied to community with piping system installed in all the streets. Each household take water connection from these pipelines installed in the streets. Almost 91.6% people were agreed and fully satisfied with water quality in which 90% people of Badar colony, 90% of Jalal Park and 95% of Dogach town were considerably showing (Dellas, 2011) satisfaction with its quality matters. Almost 8.6% of total population was dissatisfied with the quality of the drinking water delivered by this project in which Badar colony and Jalal Park were found high with 10% each than Dogach Town where 5% were dissatisfied.



	Badar Colony	Dogach Town	Jalal Park
Satisfied	90%	95%	90%
Dissatisfied	10%	5%	10%

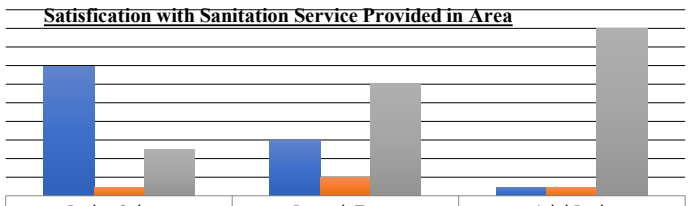
Figure 6.Community Satisfaction with Water Quality after Intervention

This mixing of sewage water was due to leakage of sewerage pipe lines and low pressure in the water pipeline. Drinking water was supplied on shift (Narrod et al., 2009) time and During the supply of water pressure detect contamination but as pressure go low it suck the sewage (Black water) around the sewerage pipe lines and made (Schwartz, 2008) it much contaminated. Hence people were content with the working of existing sanitation system developed by the Development agencies.

4.3.5 Community Satisfaction with Sanitation Services after Intervention

Centralized sanitation system was developed in the local community with a disposal station for treating wastewater after delivered into (Grimsey and Lewis, 2005) other water bodies. Almost 58% population was satisfied with the sanitation services in which Jalal Park and Dogach Town founded high with 90% and 60% respectively than Badar Colony which have 25% population satisfied with the sanitation services.7% of total population show their response normal about the sanitation working condition and services. Almost 35% population was dissatisfied with working of sanitation infrastructure and services which provide by the developmental actors in local community. Almost 70% population of

Badar Colony showed dissatisfaction with sanitation services while 30% and 5% population of Dogach town and Jalal Park showed dissatisfaction respectively.



	Badar Colony	Dogach Town	Jalal Park
Dissatisfied	70%	30%	5%
Normal	5%	10%	5%
Satisfied	25%	60%	90%

Figure 7.Community Satisfaction with Sanitation Service after Project

It was very considerable thing that majority of population in Badar Colony and Dogach Town was dissatisfied with the Sanitation services. Both the service provider agencies and beneficial of these service take into account about this matter and following some key factors founded for the poor working of sanitation services in the project area. Extra-sanitation connection on sanitation pipe lines which affects on the loading capacity of piping networks (Wellens et al., 2013). Poor solid waste management, Household solid waste put forward in drainage lines, shopping and plastic bags block the sanitation pipe lines and become the reason of overflow of Gutters (Main Drain line).

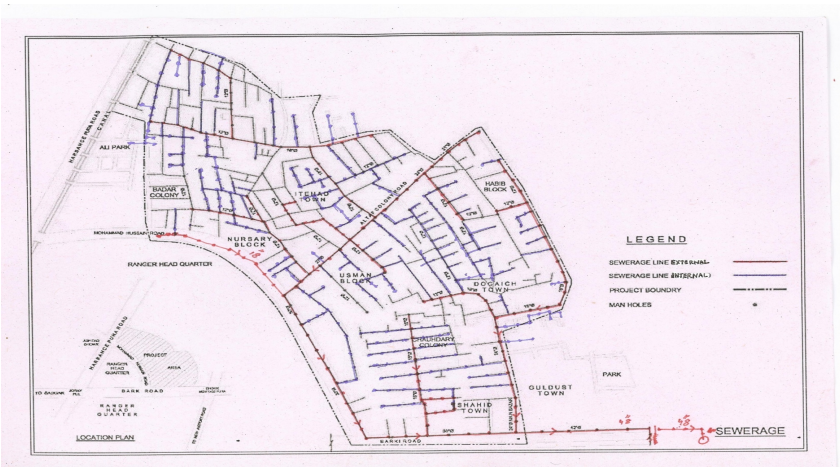


Figure 8. Map of Sewerage Piping Network Installed

While Poor handling behavior of sanitary worker, Imbalanced land and street of Badar colony put sever bad affects on the sewerage pipe line and waste water not drain out well. In the result it block the sewerage piping network and make it over flow (Tang et al., 2010) which become much repulsive for people of Badar colony. So 70% population of Badar Colony was not satisfied with the sanitation services same condition was found in Dogach Town.

4.3.6 Primary Treatment and Disposal Station

Sewerage water accumulated to the main trunk lines which carried it to a disposal station build outside the community where this water stored for primary treatment and then dispose into surface water bodies. this waste water some time also utilized for the irrigation of the local crops by farmers which safe their money, recharge the ground water, recycle water & nutrients but also put sever impacts on the soil and human health creating the water based diseases and transformation of heavy metals from water to vegetables and to human bodies.

4.3.7 Water Supply and Sanitation Billing and Revenue Collection

Local Community was being provided with safe drinking water and adequate sanitation services and were satisfied on its services. WASCO had developed monthly billing and revenue collection system for the water supply and sanitation to run this scheme successfully.

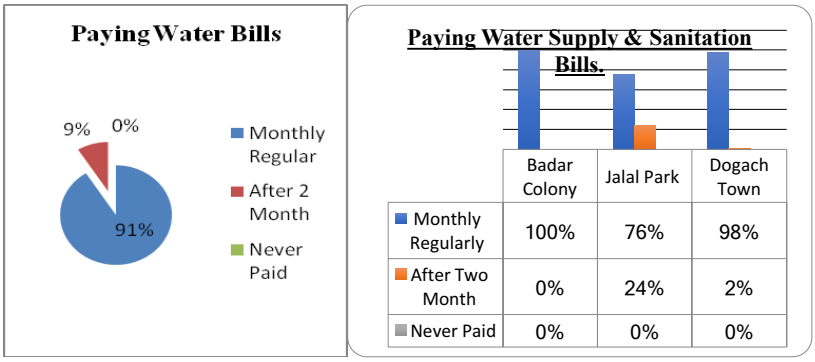


Figure 9. WASH Recovery Bills

There was 100% revenue collection and community was paying their bills in which almost 91% communities were paying monthly bills regularly and just 9% people used to pay their WATSAN bills after two month. There was not a single defaulter (Thomsan et al., 2013) founded in the selected areas. Almost 24% population of the Jalal Park just paid their WASH services bill after two month based on their economic status but one point clearly noticed that recovery rate was almost 100%.

4.3.8 Health and Hygiene Education in Schools

Hygiene education was also provided to the community of project area as it was determine the more than 90% water related disease (WaterAid, 2012) controlled by the safe hygienic condition. A health and Hygiene professional was deputed for the provision of Hygiene education to the local area. All the educational institution (Government and Private) which come under the jurisdiction of project area take into account and Hygiene professional use to visit 3-5 community school daily and gave the knowledge, awareness and understanding to school children and teachers about hygiene promotion at school and house level.

For the promotion of Hygienic condition and Hygiene Education Child to Child Approach was used. Hygiene professional educate school children about the hygiene with hygiene practice and activities and also ask them to discuss it with their parents (Isunju, 2009) and maintain hygienic condition of household and participation in the (Nisar, 2013) WASH Project. Mostly school teachers were from local area and they become a source of change and mobilization in the areas where from they belong as people use to respect teachers. So teacher also become key person of mobilize community for the participation in the project development.

4.4 Impact of WASH Development on Human Life

This intervention put very positive impact of various aspect of human life as given below.

4.4.1 Socioeconomic impact

Social mobilization team provided a best platform for community members to be united and perform their roles effectively in developing WATSAN services. Almost 93% population of study area attributed increasing of their social networking in – out of this community. 93% population showed that with the development of WATSAN facilities it increase strong social coordination and cohesion among community peoples.94% population agreed that this project enhanced their social status, developed their dignity and also vanish social stigma of “Dirty Birds, Dirty Village”. Almost 91% expressed positive economic growth due to the safe WASH services.

4.4.2 Equal Gender Opportunities

This project provided equal chances to both male and female to work and perform roles positively for WASH development. 94% population strongly agreed that this project play vital role in women empowerment and capacity building of community people. Almost 96% population expressed that engaging multi-stakeholder in the WASH intervention like this project increased the strong social integration among the local communities. while

79% population expressed their strongly agreed point with worth of involvement of Women & youth in WASH development sector.

4.4.3 Environmental Improvements

After the developing the WASH services in the area environmental improvement were very visible and almost 80% population of study area agreed that this project improve the local environment at optimum level. They further added that project improve the street condition of local area, make it very clean and smooth whereas 80% population showed their satisfaction with the improvement of Street of area. They further added that it also improve the hygienic condition of the local community environment. Almost 82% population of study area showed their satisfaction with the positive environmental improvement while almost 84% expressed the logical environmental sustainability due to development of WASH services in local community.

4.4.4 WASH Interventions on Health Development

Almost 86% population of study area agreed that with the provision of WATSAN services; the incidence of disease occurrence and prevalence rate declined at almost 90% & improved health status, and they showed their satisfaction with the decreasing of disease rates in the society. Almost 87% population demonstrated that average expenditures of health reduced with the attaining of WASH service in the local area.85% population expressed their satisfaction with the improving (Schouten and Mathenge, 2010) of health status of community people after the intervention of WASH in the study area.

4.4.5 Educational Improvement

After the provision of WASH services in community education level improved significant. Almost 87% population of study area agreed that this project brought visible educational improvement and increased educational status of community as whole by reducing the absence of student from schools which were due to poor health & environmental status. They added that it also contribute in betterment of Girls education, hygiene and knowledge management. Almost 90% population expressed their opinion that WATSAN intervention play very vital role in improvement (Rogerson, 1999) of attendance of school going children. They added that it was a role model for Government and other development actors for education improvement by developing the WASH services in the backward suburban area while 88% population showed their satisfaction with the educational development in the study area after providing the WATSAN facilities to community.

4.4.6 Project Ownership & Sustainability

Community of local study area actively engaged in all the phases of water supply and sanitation scheme's development. Public participation considered a key of communal ownership about any (Manase et al., 2009) intervention. People of study area seemed all the infrastructues of this project as their own property.They took much interest in the care and safty of project's infrastructure. Almost 87% population of selected study areas attributed that it is responsibility of community people to take special interest in caring of project infrastructures. Whereas 93% population showed the ownership of this scheme and they considered it a best task for their own, family and friend's life. All the population agreed that Public-Private Partnership is key of project's (Evans et al., 2014) ownership and sustainability.

All the population of study area demonstrated that Public-private partnership is key of sustainable development of all types of intervention especially in basic services attainment like water and sanitation. All the population determined that sense of ownership increase the life and chances of infrstructural sustainability. Community members also attributed that with the participation in this WASH developmental project they felt a inner satisfaction and virtue whole the time. They took and considered all the aspects like WATSAN Pipelines , tubewell, Overhead Reservoir and other parts of this scheme as their own assets and property same results were founded by (Cotruvo et al., 2014). They showed much responsibility and caring about the project transportation. According to population of selected areas Public-private partnership is key of communal belongingness, association and affiliation with project parts and also between each others in community. They added that it developed the sense of ownership of project among local community. With the creation of ownership of project assets people took much interest in caring and loving with this scheme which ensure and increase the (Zhang, 2012) long life, capacity, capability and sustainability of the project.

5. Conclusion & Recommendation

This study concluded that a bottom up approach with the active involvement of different stakeholders is the best approach to ensure equal & adequate access of safe WASH services and their sustainability. Local community, its culture and available resources also played significant role in ensuring of accountability and transparency of the resources, its implementation, social integrity and poverty reduction through utilization in WASH Development projects with collective wisdom. It was observed that involving multiple stakeholders in Water related projects clearly reduced the work burden of the Government and increased level of community ownership & project sustainability.

This study suggested that multiple stakeholders' approaches with a paradigm shift of public private partnership (PPP) philosophy should be taken into practice for providing efficient and decent sustainable WASH services in pro-poor communities of South Asian

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Communities. Youth , media and educational institution should also be involved for the social mobilization, conducting the right as well as need based assessment studies for the developing WASH projects in most vulnerable communities. National and Regional targets & policies should be clearly defined about the Water, sanitation and Hygiene to achieve universal access to WASH facilities. These will be supporting initiatives for meeting Sustainable Development Goals (SDGs) 6 with Agenda 2030 in a smart way from grassroots to national and regional to Global level.

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