SFD Report

Jatoi

Final Report

This SFD Report - comprehensive - was prepared by
WaterAid Pakistan

Date of production: 04/09/2018

Last update: 04/10/2018

SFD Report Jatoi, Pakistan, 2018

Produced by: WaterAid Pakistan

Author: Iqbal Badruddin

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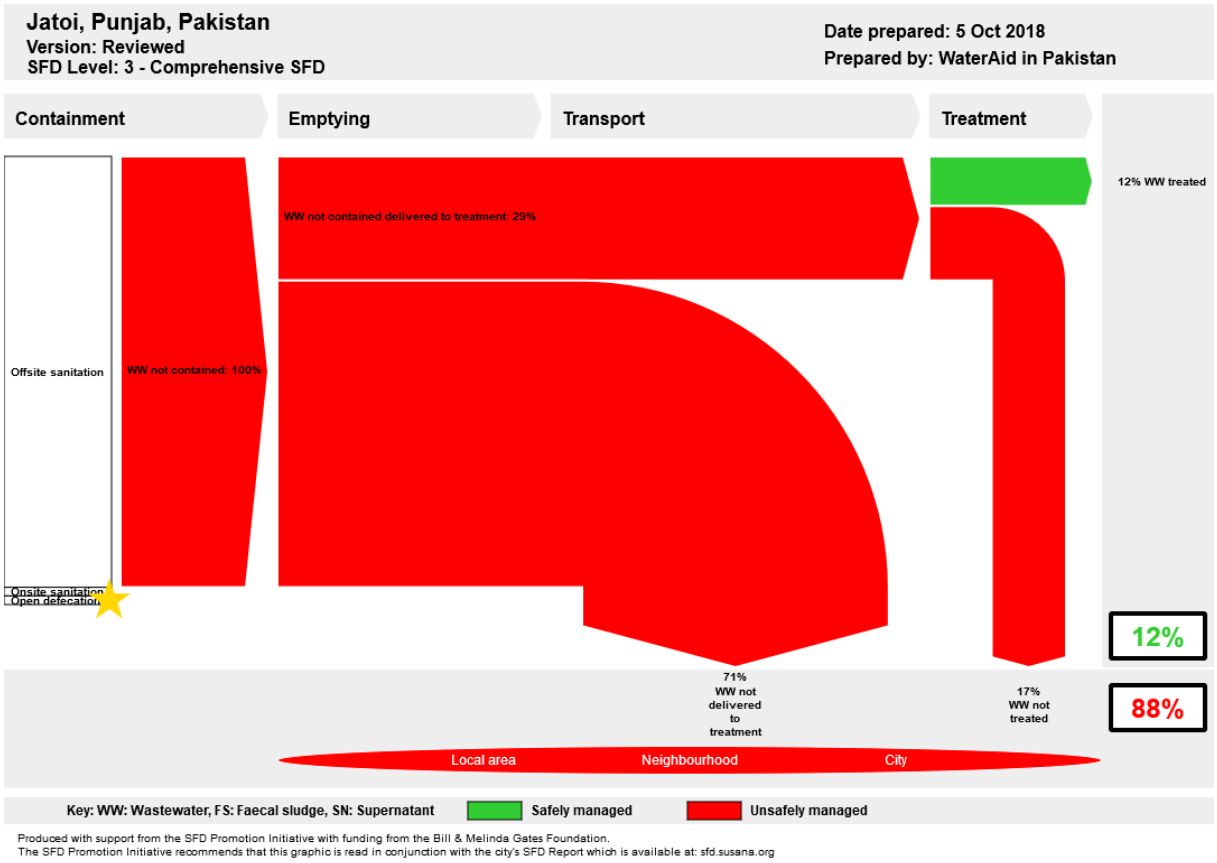
1. The SFD Graphic



Produced with support from the SFD Promotion Initiative with funding from the Bill & Melinda Gates Foundation.
The SFD Promotion Initiative recommends that this graphic is read in conjunction with the city's SFD Report which is available at: sfd.susana.org

2. Diagram information

SFD Level:

Comprehensive

Produced by:

WaterAid in Pakistan

Status:

Final

Date of production:

04/09/2018

3. General city information

Jatoi city has twenty-two urban wards and is located in the Muzaffargarh district of Southern Punjab. The city is a peri-urban area and most of the settlements are informal. Lack of available land is a common issue. The total population of the city is 159,144, according to the 2017 census report.

Most of the households use hand pumps for drinking water. The Public Health and Engineering Department has constructed two water supply schemes, but these are not connected to any water delivery network. Water quality is an issue and a water quality laboratory is being established in the office of AGAHE (a local civil society organisation). A water quality test conducted by AGAHE in ward 12 of Jatoi city shows that the water used is not chemically or biologically safe for human consumption (WQTPE, 2017). Most houses have their own latrines, and hand washing facilities range from jerry cans to wash basins.

Most of the residents of the city are daily waged workers with a low monthly income.

The poor hygiene conditions in the area are reflected in the data from health facilities, which indicate a predominance of water borne diseases.

The land is made up of alluvial soil and is fertile due to the presence of a canal irrigation network. The number of tube wells is increasing rapidly in the area and these are used to irrigate agricultural crops, mainly sugar cane, rice, maize, wheat and cotton. The city has a natural topographical inclination from north to south.

The climate is extremely dry throughout the year. The summer season lasts from April to October, when the mean temperature is 42ºC. The winters are relatively cool, with a mean temperature of 28ºC. The city has an average rainfall of 150 mm per year.

4. Service outcomes

Eighty-eight percent of Jatoi's faecal waste ends up untreated in the environment.

Containment:

Ninety-seven percent of households in Jatoi use household latrines with off-site systems. Less than two percent of households use 'septic tanks', which function as sealed holding (conservancy) tanks (fully lined tanks) with no outlets. Nearly zero percent of the population practice open defecation (PDWSH, 2017 & kII's).

Emptying and transport:

The off-site systems include household latrines discharging directly into open drains (48 percent of total population), which take the faecal waste (usually including solid waste) through a network of open and covered drains to a large central sewer. Other off-site systems discharge directly into water bodies (35 percent) or on to undeveloped open ground (17 percent).

The network is broken at several points (pipes are typically broken to release blockages) so the faecal waste often ends up in water streams and open areas. The main drains and sewers discharge either on to farmland or into a wastewater treatment plant. The municipal corporation has one vacuum truck for the whole city, which is rarely used and only for clearing major blockages. Emptying of the few existing septic tanks is carried out informally by the municipal sanitary workers, and the waste is disposed of in open drains and water bodies, and on farmland.

Figure :1 Undeveloped area used for the sewerage waste from a ward in Jatoi

Treatment and disposal:

Only 29 percent of the city's faecal waste reaches the wastewater treatment facility, and only 12 percent is treated. Treatment takes place at a centralised sewage water treatment plant constructed with World Bank funding in 2007-2008, which is not functioning well. This treatment plant has three major components: screening (solid waste is separated), settlement chamber and transport to disposal (aeriated lagoon) (see **Fig 2)**. Observations of the treatment disposal points noted that the base of the disposal points is not solid (cemented) and so the treated water gets dried up into the land, resulting in further contamination of the groundwater (see **Fig 3)**. Furthermore, if both disposal points fill up, the water is channelled out to nearby irrigated land through an exit point constructed at the end of second disposal point (see **Fig 4**).

Figure 2: Treatment plant disposal point in Jatoi

Figure 3: Treatment plant disposal point #2

Figure 4: Treated water exit point at disposal point #2

The city has no piped drinking water supply network and most houses use water from hand pumps built in or near their houses for drinking purposes. Latrines and the septic tanks are not constructed at a safe distance from water sources due to lack of available land.

Drinking water quality is an issue. Residents are becoming increasingly aware of water contamination and some are using drinking water treatment methods in their homes. Women are largely responsible for drinking water collection and its treatment.

5. Service delivery context

In 2006, the Government of Pakistan approved the National Sanitation Policy. The policy aims to provide a comprehensive structure and policy recommendations to the federal, provincial and the local governments through provincial sanitation strategies, plans and programmes.

At the provincial level, in May 2015, the Punjab sanitation policy was introduced to address the province's sanitation issues. The policy aims towards "management of human excreta", safe disposal of liquid waste and promotion of health and hygiene good practices for the improvement of public health and environment.

There are no guidelines or directives regarding faecal sludge or waste water management.

The municipal committee is responsible for the provision of sanitation services to the city. The municipal sanitary workers themselves provide out-of-hours private services such as unblocking open and underground drains for a fee of PKR 150-200 (US$ 1.20-1.80) per household and emptying of domestic septic tanks for a fee of around PKR 2,000 (US$ 14-19).

6. Overview of stakeholders

The Ministry of Climate Change (MoCC) leads on drinking water and sanitation at federal level and thus is responsible for formulating policy, setting standards, reporting and coordination of regional and international commitments.

The prime responsibility for service provision related to drinking water and sanitation services lies with elected local councils and local government departments in their geographical jurisdictions. Following the 18th amendment to the Constitution, power was delegated to each province to make and implement their own policies to meet their specific needs. While the federal government and provincial government make policies, the provincial departments play a much larger role through resource allocation, project identification and service delivery, including O&M of large schemes. Due to the existence of multiple legislation and mandate holding institutions (local governments, public health engineering departments (PHEDs), local development authorities and utilities including water and sanitation agencies (WASAs) and water and sanitation companies in large cities), roles overlap, and financing of service provision is planned and unplanned (annual development plans, vertical programmes or parliamentarian funds, grants, etc.). The operation and maintenance of water supply and sanitation schemes is assigned to local councils in urban areas, while in rural areas this responsibility is entrusted to local community groups organised as community-based organisations in the majority of the provinces.

Responsibility for monitoring, control and oversight of national/provincial environment quality standards on municipal/industrial effluent, drinking water, noise, air, etc. is delegated to the provincial environment protection agencies under the provincial Environmental Protection Acts. However, there is no legal framework that binds and empowers the environment protection agencies to perform functions such as drafting rules and standards for regulating public and private water service providers, including financial management regulations, licensing and regulation of private service providers, control of pricing for retail and bulk consumers, service standards and performance indicators, customer service regulations and regulations on executing their powers to conduct public hearings to redress public complaints/grievances.

Because several provincial departments are responsible for WASH, an integrated approach needs to be developed to envision and design common implementation plans that are owned by multiple departments and reinforced by all major supporting organisations. The provincial WASH Sector Plan 2014-2024 proposed the creation of programme management units (PMUs) at provincial level. In Punjab, the PMU was created in 2017. This unit will not only steer implementation of and reporting on WASH initiatives but also provide a platform for coordination, joint planning and periodic sector reviews to avoid duplication of efforts and resources.

7. Process of SFD development

Data was collected from secondary sources, and primary data was collected from visits to the city (observation), key informant interviews (KIIs) and focus group discussions (FGDs).

More than ten FGDs were conducted in various parts of the city involving shop keepers, sanitation workers, labourers, three women's groups and residents of various wards. Nine KIIs were conducted with senior officials of the city, including the sanitation head of the

municipal committee and the district health commissioner. Observations were carried out to cross-check the data collected from the various sources. District hospitals were also visited.

After collecting all the data, the SFD was produced using the SFD graphic generator and was shared with the local stakeholder who support the visits, the private organisation AGAHE (Association for Gender Awareness & Human Empowerment).

8. Credibility of data

A literature search revealed that there was very little public data available on the existing sanitation services. From the 2017 census, only the population figures and the number of households had been uploaded by the government.

Therefore, most of the data in this report comes from the observations, field visits, KIIs and FGDs, and only a small portion is secondary data.

Using a variety of sources of primary information helped triangulate and improve the validity of the data.

9. List of data sources

- Published Reports
  1) 1998 Census Report
  2) 2017 Census Report
  3) (WQTPR, 2017). Water quality test pre-report, 2017

Jatoi, Pakistan, 2018

Produced by:

Iqbal Badruddin, WaterAid

Editing: WaterAid

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Abbreviations

NSP	National Sanitation Policy
PSP	Punjab Sanitation Policy
TMA	Tehsil Management Authority
AGAHE	Association for Gender Awareness & Human Empowerment
PEPA	Pakistan Environment Protection Agency
PATS	Pakistan Approach to Total Sanitation
PSLM	Pakistan Social and Living Standards Measurement
MDG	Millennium Development Goals
SDG	Sustainable Development Goals
MC	Municipal cooperation
BHU	Basic Health Unit
WASA	Water and Sanitation Authority
PHED	Pakistan Health & Engineering Department
PMU	Punjab Management Unit
LHW	Lady health workers

1 City context

Jatoi is a city in the Muzaffargarh District of Punjab province, Pakistan. This historically significant city is located in the southern part of the province. Rajanpur District and DG Khan District lie to its west, District Multan to its east, Tehsil Ali Pur to its north and Muzaffargarh tehsil (town) to its south (Figure 1). The total area of the Jatoi tehsil is 1,010 square kilometres. The city consists of 22 wards (sectors) and is administered by a municipal committee.

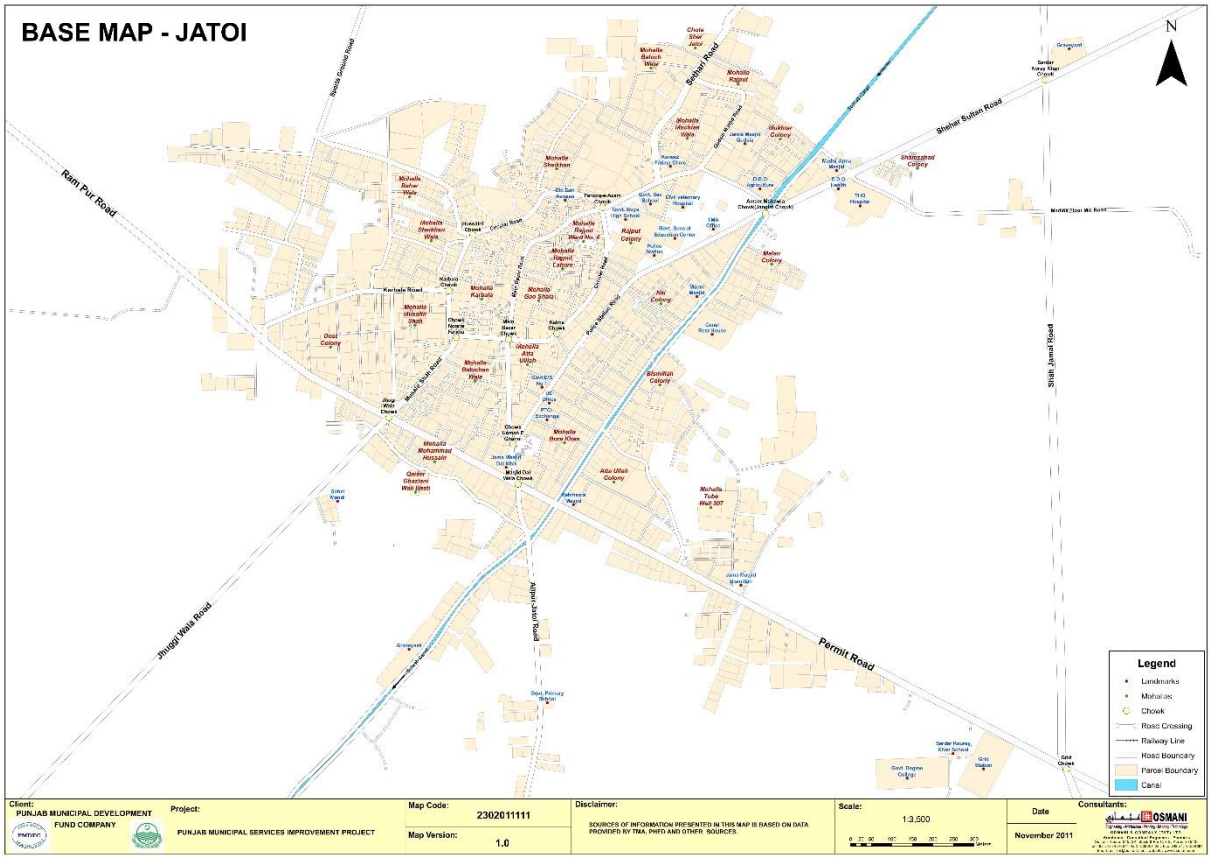

Figure 1: Base map of Jatoi

The topography of the city and its hinterland is plain. The land is made up of alluvial soils, which are fertile due to the presence of a canal irrigation system. The number of tube wells in the area is increasing rapidly. The city has a natural topographical inclination from north to south.

The climate of the area is extremely dry throughout the year. The summer season lasts from April to October. May, June and July are the hottest months. Rainfall decreases from north to south and is very uncertain. Average rainfall is about 150 mm per year.

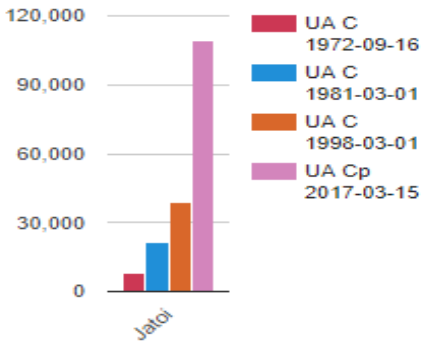

Figure 2: Population growth chart Jatoi.

Figure 2 illustrates the population growth of Jatoi city from 1972 (red) to 2017 (purple).

2 Service Outcomes

The service outcomes are based on information gathered from field visits, KIIs, FDGs and secondary data sources. The 1998 and 2017 population censuses were the key secondary sources. Data on sanitation were collected through KIIs and were crosschecked. The KIIs also helped to understand the service delivery chain. The data show that most people living in Jatoi rely on off-site sanitation systems.

2.1 Overview

List A: Where does the toilet discharge to? (i.e. what type of containment technology, if any?)	List B: What is the containment technology connected to? (i.e. where does the outlet or overflow discharge to, if anything?)									
	to centralised combined sewer	to centralised foul/separate sewer	to decentralised combined sewer	to decentralised foul/separate sewer	to soakpit	to open drain or storm sewer	to water body	to open ground	to 'don't know where'	no outlet or overflow
No onsite container. Toilet discharges directly to destination given in List B					Significant risk of GW pollution Low risk of GW pollution	T1A1C6	T1A1C7	T1A1C8		Not Applicable
Septic tank					Significant risk of GW pollution Low risk of GW pollution					
Fully lined tank (sealed)					Significant risk of GW pollution Low risk of GW pollution					
Lined tank with impermeable walls and open bottom	Significant risk of GW pollution Low risk of GW pollution	Significant risk of GW pollution Low risk of GW pollution	Significant risk of GW pollution Low risk of GW pollution	Significant risk of GW pollution Low risk of GW pollution	Significant risk of GW pollution Low risk of GW pollution					Significant risk of GW pollution Low risk of GW pollution
Lined pit with semi-permeable walls and open bottom	Not Applicable									Significant risk of GW pollution Low risk of GW pollution
Unlined pit										Significant risk of GW pollution Low risk of GW pollution
Pit (all types), never emptied but abandoned when full and covered with soil										Significant risk of GW pollution Low risk of GW pollution
Pit (all types), never emptied, abandoned when full but NOT adequately covered with soil										
Toilet failed, damaged, collapsed or flooded										
Containment (septic tank or tank or pit latrine) failed, damaged, collapsed or flooded										
No toilet. Open defecation	Not Applicable									Not Applicable

Figure 3: SFD selection Grid

The SFD selection grid shows the range of sanitation technologies and methods used to support the flow of sanitation in the city (Figure 3).

Household sanitation:

Ninety-seven percent of households in Jatoi use household latrines with off-site systems. Less than one percent of households use 'septic tanks', which function as sealed holding (conservancy) tanks with no outlets. According to data collected from the KIIs, almost zero percent of the population practice open defecation. There are no shared or community toilets available in the city.

Institutions:

All education institutions and schools in the city have toilets, although it was noted during observations that some schools have fewer toilets than required or had non-functioning toilets.

Commercial Areas:

Only a very small area of Jatoi is for markets or commercial purposes. From observations, it was noted that one toilet was available for every five shops in the market and the vendors were not satisfied with the quantity of the toilets because they were not properly maintained and were unhygienic.

The flow of excreta from these commercial areas was limited and the study focused on the residential areas but, when observed, waste generated from these areas was not managed and was left either on open ground or in water bodies or fields (whichever is closest).

Containment:

The city has very few on-site sanitation systems at the household level. Off-site systems include household latrines discharging directly into open drains along the road (48 percent of the total population), water bodies (35 percent) or on to undeveloped open grounds (17 percent). Figures from KIIs cross-checked with observations.

Emptying:

Open drains receive faecal waste directly from the toilets. Faecal sludge and septage emptying services in the city are almost non-existent. Less than one percent of households have 'septic tanks' (sealed holding (conservancy) tanks) and, when necessary, they contact municipality workers and pay them to empty their tanks. These workers are not trained sanitation staff. The septic tanks that exist in some areas are emptied manually by the sanitation workers. The city only has one sludge tanker and because it is not maintained properly, it is not able to empty household septic tanks. A KII with a sanitation worker revealed that there was no safety gear available to protect the workers from dangerous diseases. In a city with population of more than 100,000 people, there were only 72 sanitation workers for the city's 22 wards. Thirty-six are permanent staff and 36 are on daily wages, clearly indicating that the city is in crisis in terms of catering for the sanitation needs of the city (KII 1, 2018).

During the visit to the municipal cooperation (MC) office, it emerged that the municipal corporation has not developed any code of conduct or rules and regulations for training of the workers or for any operational processes.

Transportation:

A network of open and covered drains transports the faecal waste (typically including solid waste) to a large central sewer. Septic tanks cost PKR 1,200 (US$ 8.00) to empty.

MC sanitation remove blockages from storm water drains and the underground sewer when complaints are received from local residents. The waste is disposed of into the open drainage system on the road where people pass by. Blockages in open drains were easily removed, for which a fee of PKR 150-300 (US$ 1.00- 2.50) is charged.

The city only has one vacuum truck. But in any case, vehicles cannot navigate the narrow streets of this very congested city. The KII with the person in charge of sanitation in the city revealed that for this reason the vacuum truck is only used to unblock the city sewer, which is connected to the treatment plant. The resultant waste is then dumped into a nearby water body or lake (KII 1, 2018).

Treatment and disposal:

Currently there is only one treatment plant for Jatoi city. Only 48 percent of the houses in its 22 wards are connected to open drains or storm sewers that are connected to the sewer network, which in turn connected to the treatment plant. However, of that 48 percent, only 60 percent of the wastewater (includes all waste) is delivered to the plant for treatment. The remaining 40 percent is not transported to the plant due to leakages caused by damage to the sewer pipes by local residents attempting to remove blockages. In turn, the treatment plant is only able to treat 40 percent of the waste water it receives. It was also reported that dumping and discharge by MC workers looking to earn extra cash out of hours was not done properly.

2.2 SFD Matrix

Jatoi, Punjab, Pakistan, 5 Oct 2018. SFD Level: 3 - Comprehensive SFD
Population: 159144
Proportion of tanks: septic tanks: 0%, fully lined tanks: 0%, lined, open botton

System label	Pop	W4c	W5c
System description	Proportion of population using this type of system	Proportion of wastewater in open sewer or storm drain system, which is delivered to treatment plants	Proportion of wastewater delivered to treatment plants, which is treated
T1A1C6 Toilet discharges directly to open drain or storm sewer	48.0	60.0	40.0
T1A1C7 Toilet discharges directly to water body	35.0		
T1A1C8 Toilet discharges directly to open ground	17.0		

Figure 4: SFD Matrix

2.2.1 Discussion of the SFD matrix

Figure 4 summarises the service chain and the percentage of the population using the various technologies and methods. During the observations and field visits, it was noted that the city relies on off-site sanitation systems. Less than one percent of the population is connected proper underground sewer lines (just one street in Ward 12). The majority of the population is connected to a roadside open drainage system. Thus, 48 percent of the population is connected to open drains (T1A1C6) and storm sewers, of which more than half (60 percent) is delivered to the treatment plant (W4c). Owing to damage to the pipes, 40 percent of that 45 percent (TIAIC6) leaks into the environment (KII 2, 2018).

The proportion of toilets that discharge directly into water bodies (T1A1C7) was reported during the field visit to be 35 percent. Houses near canals that have no other option or facility for dumping waste have created paths to nearby water bodies, where the waste left untreated.

During visits to the narrow streets of the inner city, it was reported and observed that the houses towards the centre of these areas, where there is no gravity flow, face many challenges such as noxious smells and standing wastewater in the streets making then difficult to traverse. Toilets that discharge directly on to open ground (T1A1C8) account for 17 percent, based on

the assumption that this is practiced in the centre in each ward. Residents in these areas dispose of their wastewater on undeveloped ground, carrying it in buckets to be dumped on the ground or digging channels to transport it to open ground.

Some wards on the city's outskirts (wards 6 and 7) are regarded as less developed, and in the KIIs and FDGs, it was reported that some people practice open defecation. It is unknown where they practice open defecation, but because of the easy access, it is assumed be in fields. This is estimated at one quarter of one percent and rounds down to zero percent.

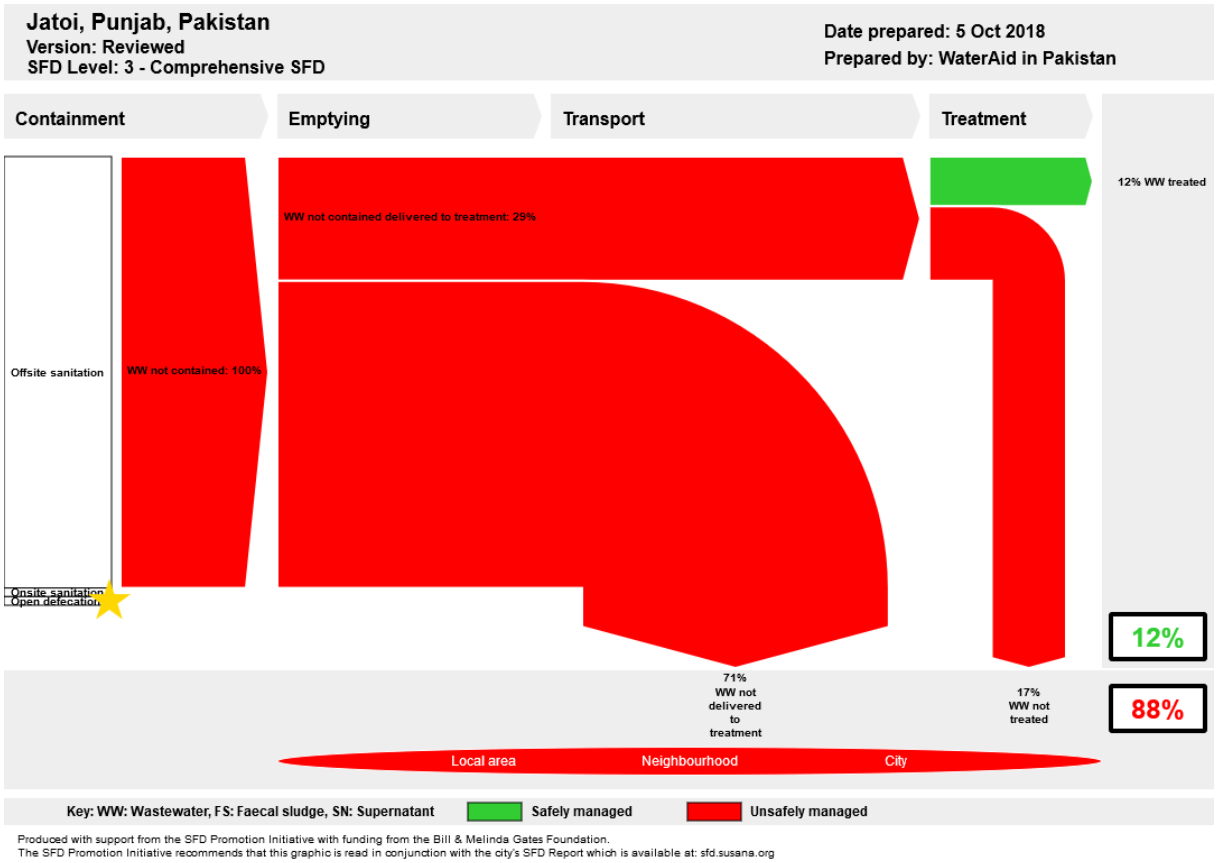

Figure 5: SFD

According to the SFD (Figure 5), 12 percent of excreta generated is treated/managed safely at the city treatment plant. A further 17 percent is delivered to the treatment plant but is untreated. This indicates that the treatment plant is not fully operational and is only working partially.

Risk of groundwater contamination

The city is fairly flat, and the entire population relies on groundwater for drinking. Water quality tests have found that in the absence of a proper sanitation system and due to the presence of chemicals, the water is not suitable for drinking (WQTPR, 2017). Where the depth of the groundwater table is more than 10 metres, the contamination risk is minimal. The lateral separation meter indicates significant risk, however. Given the distance between groundwater sources and sanitation facilities, it can be assumed that the sewerage water mixes easily with the underground water. As groundwater is the city's main source of drinking water, it can be concluded that, in general, the water in the city is not safe to drink from a biological point of view due to faecal contamination (Table 1)".

Table 1. Water quality test pre-report, (AGAHE) Ward 12, Jatoi, 2017

Sr	Parameters	WHO Desirable Level	WHO Max permissible Level	WAP Standard Quality	Results
			CHEMICAL ANALYSIS		
1	Soluble salts	500 ppm	1500 ppm	$< 1000\ ppm$	$403\ ppm$
2	PH	7.0-8.5	6.5-9.2	$6.5 - 8.5$	7.61
3	Solidity as CaCo3	100 ppm	500 ppm	< 500m ppm	According to the standards
4	Um/cm	-	-	–	41Mv
5	Chloride	200 ppm	600 ppm	600 ppm	According to the standards
6	Calcium	75 ppm	200 ppm	250 ppm	According to the standards
7	Magnesium	50 ppm	150 ppm	150 ppm	According to the standards
8	Iron	0.1	1	0.1	0.1
9	Arsenic	5 ppb	50 ppb	0.05 mg./ 1. /50ppb	25ppb
10	Fluoride	0.5mg/L	1.50 mg/L	1.50 mg/L	5.6mg/1

Sr	***Parameter* (Biological Analysis)**	**WAP water Quality standard**	**Results**
11	No. of Coli form colonies/100ml	00	12

Certainty of data used for the SFD Matrix

This report was produced largely based on data collected in the field because the data required was not available on the government platforms/databases or from government departments. The field work included collecting data on and understanding sanitation services at the household and neighbourhood level, the capacity of the city's treatment plant and how waste is discharged in the drains/sewerage lines. The open defecation rate is estimated based on interviews with the key stakeholders of the city and JMP report (PDWSH, 2017).

3 Service delivery context

3.1 Policy, legislation and regulation

3.1.1 Policy

The 1973 Constitution of Pakistan lays down several guidelines for water and sanitation policy. Two such policies are the 2006 National Sanitation Policy and the 2009 National Drinking Water Policy. Under the 2006 policy, every citizen by law should have access to a proper sewage system and an open defecation free environment where liquid and solid waste is safely disposed of. Article 24(3)(e) (ii) clearly defines this as the fundamental right of every citizen regardless of their class and aims to improve their health and hygiene. Moreover, it provides for coordination between the national, provincial, district and town/tehsil municipal administrations (TMAs) to address cross-sector issues such as health and education. Another aim is to set gender equality policies and especially encourages women to participate in improving sanitation practices in their areas, since these issues affect them more than men. It sets incentives to achieve 'open defecation free' status and '100 percent sanitation coverage', mainly for tehsil/towns, and emphasizes the use of technology in public and private sectors to achieve their goals. The 2009 policy not only aims to provide clean and safe drinking water at affordable rates but also to improve the sanitation sector at country level. The primary focus of both policies is to improve the quality of life of the citizens and maintain coordination between sectors to address issues more effectively at all levels. The Pakistan Approach for Total Sanitation is another policy which aims to achieve similar goals and works with the water policy to improve sanitation conditions in both urban and rural areas and emphasises gender inclusion in every aspect of the programme. It further involves communities towards this goal through approaches such as Community Led Total Sanitation, School Led Total Sanitation and similar programmes.

3.1.2 Institutional roles

The Ministry of Climate Change (MoCC) leads on drinking water and sanitation at federal level and is responsible for formulating policy, setting standards, reporting and coordinating regional and international commitments. The prime responsibility for drinking water and sanitation service provision lies with the elected local councils and local government department in their geographical jurisdictions. Following the 18th amendment of the Constitution, power has been delegated to each province to make and implement their own policies to meet their specific needs. The federal government and provincial government make policies to address public issues. Here, the say of stakeholders plays a very important role in making sure that policy is

realistic, feasible and widely supported and accepted. However, in practice, the provincial departments play a much larger role through resource allocation, project identification and service delivery, including O&M of large schemes. Due to existence of multiple legislation and mandate holding institutions (local governments, public health engineering departments (PHEDs), local development authorities and utilities including water and sanitation agencies (WASAs) and water and sanitation companies in large cities), roles overlap, and financing of service provision is planned and unplanned (annual development plans, vertical programmes or parliamentarian funds, grants, etc.). The operation and maintenance of water supply and sanitation schemes is assigned to local councils in urban areas, while in rural areas this responsibility is entrusted to local community groups organised as community-based organisations in the majority of the provinces.

Responsibility for monitoring, control and oversight of national/provincial environment quality standards on municipal/industrial effluent, drinking water, noise, air, etc. is delegated to the provincial environment protection agencies under the provincial Environmental Protection Acts. However, there is no legal framework that binds and empowers the environment protection agencies to perform functions such as drafting rules and standards for regulating public and private water service providers, including financial management regulations, licensing and regulation of private service providers, control of pricing for retail and bulk consumers, service standards and performance indicators, customer service regulations and regulations on executing their powers to conduct public hearings to redress public complaints/grievances.

Because several provincial departments are responsible for WASH, an integrated approach needs to be developed to envision and design common implementation plans that are owned by multiple departments and reinforced by all major supporting organisations. The provincial WASH Sector Plan 2014-2024 proposed the creation of programme management units (PMUs) at provincial level. In Punjab, the PMU was created in 2017. This unit will not only steer implementation of and reporting on WASH initiatives but also provide a platform for coordination, joint planning and periodic sector reviews to avoid duplication of efforts and resources. Table 2 shows the roles of the various institutions.

Table 2: Institutional roles and responsibilities

Roles	Institutions
Planning/ policy formulation	National, provincial & local/ district governments
Financing	Ministry of Finance (federal government) Provincial and local government through annual development plans.
Regulation	Regulatory framework from provincial government in accordance with the national sanitation policy.
Implementation	National sanitation policy implementation committee mentioned in the NSP
Operation and maintenance	Local government private sector NGOs
Monitoring and Evaluation	Self-monitoring by each department at federal, national, district/ town & UC level. NGOs & private sector participation encouraged, provincial environment protection acts

3.1.3 Service provision

The system for water supply and sanitation in Pakistan is very complex. Usually, each province oversees its water and sanitation sector, through local bodies that are responsible for this. Financial and planning matters are in the hands of the provincial governments and, in some instances, federal government. While local bodies are responsible for operation and maintenance, they do not have the power to collect charges. This creates a financial gap that invariably makes local governments ineffective.

Some cities have more centralised systems, others have decentralised systems, making it hard for the local governments to work effectively despite having sole responsibly for the sanitation sector (NSP, 2006).

3.1.4 Service standards

In accordance with the Constitution of Pakistan, the government of Pakistan introduced a national sanitation policy in 2006 to improve the country's sanitation system. The main objective of the policy focuses on safe disposal of liquid and solid wastes, including the promotion of health and hygiene practices in the country. It also envisions creating an open defecation free environment in the country (NSP, 2006).

Following the 18th amendment to the Constitution, power was delegated to each province to make and implement their own policies to meet their specific needs. Punjab government introduced the Punjab sanitation policy in 2015, which focuses on ensuring that the entire population of the province has access to safe and affordable sanitation for a quality of life by 2025.

The 1997 Pakistan Environmental Protection Act (PEPA) has set standards for the discharge of effluent and waste. It states that no person shall discharge or emit or allow the discharge of any effluent or waste that exceeds national environmental quality standards. Federal government may levy a pollution charge on any person who contravenes or fails to comply with these provisions (PEPA, 1997).

No reports for the city are available online. While water quality reports meet local government requirements, no other reports on sanitation technologies are available in the municipality. This lack of data shows that the provincial government has yet to take any interest in the city's sanitation sector, and the lack of power devolved to the local government makes the situation even worse.

As discussed earlier, the city's residents respond to the lack of sanitation services by dumping waste directly into the environment. The WASH situation in Jatoi city in general is unfavourable and budget allocation to improve the current situation needs to be considered.

3.2 Planning

3.2.1 Service targets

According to the MDG assessment of the urban areas of Pakistan, sanitation coverage is 58 percent for at least basic coverage (PDWSH, 2017). Although targets have been met and much has been achieved in the sanitation sector, 25 million people or 13 percent of people still defecate openly (UNICEF Pakistan Media Centre). Most of these people live in rural areas,

making them the most difficult to reach. Pakistan has the fifth largest number of open defecators in the world. Pakistan intends to achieve basic coverage for 100 percent of its population by 2025, and reports suggest that Pakistan has done much towards ending open defecation (PDWSH, 2017).

According to JMP 2017 estimates, 88 percent of the country's population has access to improved and unimproved latrines. Pakistan plans to improve its sanitation standing in the world and it was the first country in the world to adopt the SDG agenda through its parliament.

3.2.2 Investments

After Pakistan signed the Millennium Development Goals, the sanitation sector required a greater allocation of resources and received non-governmental financial support as well as improvement in this sector is vital for success. WSP reported that a total of US$ 5.72M had been invested by donor agency USAID, and other international funding agencies including ADB contributed ($ 1.5B) to the country's water & infrastructure services[1]. PKR 1600 billion US$12.9 billion has been allocated to the Public-Sector Development Programme, of which the Government of Pakistan allotted PKR 5 billion (US$ 40.5 million) to community development programmes and PKR 800 billion (US$ 6.5 billion) has been kept for the federal government share. PKR 16M (US$ 0.13 million) has been allocated to the Pakistan WASH strategic planning and coordination cell. International aid has always been vital to this cause, but public funds have proved to be the main contributor (67 percent), with 13 percent coming from tariffs and 11 percent from municipal expenditure.

3.3 Equity

3.3.1 Current choice of services for the urban poor

There are few sanitation services available and the urban poor rely on what is available (open drains) and their own initiative. Almost the entire city (97 percent of the population), in practice, relies on and inadequate off-site sanitation systems.

The city's municipal committee has made sure that each household has its own toilet and that no one is left out. However, the KIIs with the various stakeholders revealed that although open defecation has decreased to only 0.25 % of the total population, more work needs to be done to make the city fully open defecation free. There are no rules and regulation for sanitation in the city and budget constraints makes it impossible for citizens to ask for more. Sanitation is not a priority for the city administration, and political uncertainty has always affected the urban poor.

The residents of Jatoi city cannot afford to pay the full costs of sanitation, as the average household income is just PKR 300 (US$ 2.43) a day.

3.3.2 Plans and measures to reduce inequity

The Punjab sanitation policy aims to make huge changes to the lives of the urban poor by providing safe and affordable and equitable sanitation facilities. The policy focuses on building the technical and managerial capacities of the local governments.

[1] https://www.adb.org/countries/pakistan/main#funding

As in most areas of Punjab, in Jatoi awareness of proper sanitation and good hygiene practices is poor. Thus, the government plans to work on capacity building and behavioural change from the ground up.

3.4 Outputs

3.4.1 Capacity to meet service needs, demands and targets

During the KIIs, it was noted that more work needs to be done to improve the sanitation service chain. The main problems, according to the sanitation focal person, are the lack of coordination with provincial government and financial constraints. Sanitation workers are not trained, nor are they provided any safety equipment. Also, because the city has no water testing lab, water testing is not carried out (KII 1,2018).

3.4.2 Monitoring and reporting access to services

There is no monitoring of sanitation services in Jatoi. Although the municipality holds some reports, these were not shared with us nor they were available online. When crossed-checked, data on the city's sanitation situation was very different from that described in the reports of the municipal committee.

Although many non-governmental organisations are working to support the WASH sector, there is no monitoring mechanism in place. No weekly, monthly or yearly WASH reports are produced by the government or any other organisation. The actions of the municipality are driven by complaints made about sanitation.

Thus, government officials have shown willingness to work with other organisations to improve the sanitation sector of the city, and this SFD should support these initiatives.

3.5 Expansion

3.5.1 Stimulating demand for services

Although national sanitation policy and Punjab sanitation policy aims to build capacity and promote good health practices amongst the local population, sanitation is a new sector in Jatoi. Responsibility for the sector lies with the local government and administration. In Jatoi city, 'lady health workers' (LHW) from the district health office work to promote good hygiene and sanitation practices in the city.

The work that the government is doing to improve sanitation is linked to safe drinking water as most of the problems result from scarcity of water.

There are no rules or laws to prevent illegal dumping, and until the government starts providing proper services, this practice remains common among the urban poor. The LHWs are the main player in the city in raising awareness about WASH at the household level and advising people about good practice.

3.5.2 Strengthening service provider roles

The 2015 Punjab Sanitation Policy (PSP) includes a section to promote the role of the private sector in the sanitation industry. Private companies are encouraged to discharge their social

corporate responsibilities by undertaking initiatives that promote a safe and healthy physical environment (PSP, 2015).

The national sanitation policy is a guiding pillar for building the capacity of the private sector in WASH programmes. They will also be motivated and assisted by the government to mobilise communities to implement sanitation programmes (NSP, 2006).

Thus, it can be concluded that lack of capacity in the various sectoral organisations exacerbates the problem. Focusing on capacity building could, for example, solve the problem of dumping of all types of waste including faecal sludge in open fields.

4 Stakeholder Engagement

The city has almost no data available on the internet, so a visit was essential to getting an understanding of the current sanitation situation in Jatoi. The purpose of the research and how it would benefit them, and their area was shared with the municipal administration. This piqued their interest and encouraged them to share the problems, and needs, more openly.

4.1 Key informant interviews

Key informants interviewed included two doctors from the Basic Health Unit, the MC person in charge of sanitation, a lead sanitary worker, a sanitary supervisor, the district health deputy and three lady heath workers. All the interviews were conducted in their respective offices.

The KIIs were unstructured, which proved helpful in that a great deal of undocumented first-hand data on service delivery and the sanitation service chain became accessible. Some of the interviews with the city's key stakeholders were conducted after observations to cross-check the information they provided. For example, the interview with the person in charge of sanitation was conducted following observations of dumping points. One piece of information that we did not expect to receive was that the person in charge of sanitation in the municipality himself dumps waste into running water bodies.

The LHWs were cooperative and asked if any other information was needed. They also consented to be a part of any future studies.

The researcher also had the opportunity to visit the Basic Health Unit, where KIIs were conducted with two doctors, who shared data on health aspects and provided patient data on waterborne diseases.

4.2 Focus Group Discussions

FDGs were conducted with residents of several of the city's wards, and with some women in their homes.

A total of ten FDGs were conducted. Each participant had the opportunity to participate and share their views. Ethical considerations were taken into account parts due to safety concerns associated with interviewing women in some locations. The FDGs with government officials proved useful for them as well, as the discussion made them aware of the lack of coordination and communication between them.

4.3 Observations:

Visits to the treatment plant, dumping sites, hospital, and other government official offices helped understand the sanitation situation of the city and develop an understanding of service delivery there. The visits also helped to identify the technologies being used and how faecal sludge is being contained. Photographs were also taken as evidence of the observations.

5 Acknowledgements

We would like to thank everyone who contributed to this project, especially those who participated in the interviews for providing the information needed. Special thanks go to Mr. Ansar and Mr. Mudassir Rao from (AGAHE) for their assistance and support during the project.

6 References

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