Political Economy of Water Pollution in Pakistan: An Overview

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Abstract

Polluted water poses a serious threat to the environment, human life and even the economy. This paper aims to look into sources of water pollution in Pakistan and their impact on our socio-economic system. In particular, the paper looks as to how the polluted waters impact the rural and urban landscapes. Recent initiatives by the judiciary are highlighted in terms of addressing some of these concerns. The findings suggest that multiple institutions exist for water service delivery with overlapping jurisdiction and responsibilities rendering water governance ineffective. The key recommendations call for enhanced capacity of departments concerned in addressing water challenges vis-à-vis water pollution in the wake of post 18th amendment scenario at the federal and provincial levels. The study also recommends farmers training regarding the use of fertilizers and pesticides as well as introduction of state-of-the-art technology for the treatment of wastewater by industries to control water pollution.

Keywords: water governance, devolution, water pollution, wastewater, groundwater, NEQS, PHEDs, 18th Amendment
1. Introduction

Polluted natural resources have a detrimental impact on their users, the wider economy and the ecology. Water is an essential ingredient for life and is facing serious challenges with regards to pollution. Water pollution refers to deterioration of rivers, lakes, streams, groundwater etc. water quality. Multiple sources of pollution exist that impair the quality of water. Untreated municipal and industrial waste water as well as agricultural run-off contributes significantly to water pollution. Water pollutants include heavy metals, fecal coliform bacteria, phosphorous, sodium, nitrogen, sediments as well as pathogenic bacteria and viruses. Such water pollutants result in serious health issues. Approximately 20-40 per cent of the total hospital beds in Pakistan are occupied by patients suffering from water-borne diseases (World Wide Fund for Nature [WWF] 2007). Owing to absence of safe drinking water and sanitation services, the effects are not only seen on human health but also on economy. Environmental degradation costs Pakistan Rs 365 billion a year, which is borne by the poor. About one third of this figure goes towards expenditures incurred for health-related issues due to inadequate water supply and sanitation (Mughal 2016).

This paper analyzes the state of water pollution and its impact on human health in Pakistan. Secondly the study aims to assess the key gaps and hindrances in governance structures and mechanisms employed in water supply, legislation and pollution. In particular, the study analyzes the impact of the 18th amendment on the sector.

2. Methodology

The study is a situational analysis about water pollution in the country. The study is based on desk review of existing literature on legislation, policies, practices and governance mechanisms. Key informant interviews with a wide array of stakeholders have also been conducted.

3. Literature Review

3.1. Urban Pollution

In Pakistan, domestic wastewater is one of the primary sources of pollution in urban waterways and the environment. Though the planned urban locales may have a sewerage line to collect household wastewater, the lack of operational treatment facilities means it is discharged as it is into the streams, ponds or open drains. Older residences that rely on septic tanks or informal settlements deposit their wastewater into nearby pits or natural drains.

The situation in major cities of Pakistan is quite abysmal. Wastewater in Lahore, Pakistan’s second largest city, remains virtually untreated and is deposited into the Ravi river, which is a source of water for downstream communities. Similarly, Karachi generates 435 million gallons per day (MGD) of sewage whereas the installed capacity to treat this waste is only 151 MGD, of which only 54 MGD is actually treated while the rest remains untreated because of lack of treatment facilities (Siddiqui 2014). Approximately 87% of sewage is deposited into the Arabian Sea.

Farooq et al. (2016) state that Harnoi stream near Abbottabad has been severely affected due to anthropogenic activities that cause deterioration of water quality. Algal growth has been observed and
the stream has become non-conducive for the survival of fish and macro-invertebrates. These are indicators of a severely damaged ecosystem, natural streams, and waterways across the country.

3.2. Industrial Pollution

Industries are also a major source of surface and groundwater pollution in Pakistan. They dispose off their effluents into nearby streams, rivers, lakes and agricultural fields, which on the one hand cause diseases and on the other degrade the overall water quality. These include: chemical production, (fertilizer and pesticides), textiles, pharmaceuticals, tanneries, cement, electrical equipment, glass and ceramics, pulp and paper board, and petroleum refinery” (Siegmann & Shehzad 2006). Such industries, by and large, have no mechanisms for the treatment of wastewater before disposal either into municipal sewage network or directly into a nearby drain. Only 21 out of 1,000 large industrial units of textile, steel and others in Lahore have waste treatment plants (Alarming increase 2007). Similarly, industrial estates in Faisalabad, Karachi, and Peshawar also dispose of their waste into open spaces.

The high pollutant load of the sampled effluents, in quantities exceeding the National Environmental Quality Standards (NEQS) limits many times over in certain parameters such as the Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) coupled with the large-scale sugar production in the country signify that alarming levels of pollutants are regularly entering the environment (Akbar & Khawja 2006).

According to Nasir et al., (2012), the analysis of almost all samples taken from Gujranwala district (an industrial hub) was unfit for human consumption according to the benchmarks set by the NEQS. In the aftermath of industrial effluents being dumped into waterways, dissolved oxygen (DO) levels are decreasing whereas Biochemical Oxygen Demand (BOD) along with total dissolved solids increase in Ravi river (Nasir et al. 2012).

3.3. Agricultural Pollution

Agricultural pollution is another avenue which causes significant disturbance to the environment and water bodies (Alvina 2014). Impact of agriculture on soil includes water logging, soil erosion and salinization whereas on water quality, it entails quality impairment by agrochemicals, salts, and toxic leachates. Run-off from agriculture contains nitrogen and phosphorus-based fertilizers and varying pesticides. This chemical laden run-off then seeps through the surface and enters groundwater (Infrastructure Development Finance Company [IDFC] 2011). Excessive use of agricultural fertilizers increases the productivity of the soil, but on the contrary it impairs the underground drinkable water.

High-income countries and many emerging economies are faced with agricultural pollution. From agriculture, nitrate (chemical) is the most common contaminant for aquifers globally (Mateo-Sagasta, Zadeh and Turra H 2017). In low-income and developing economies where agricultural pollution is aggravated due to increased sediment run-off and salinization, it is a serious issue. To meet the increased food demands, both agriculture and livestock sectors’ expansion have significant implications for the already deteriorating water quality especially in Asia (ibid). To meet these growing demands’ output enhancement, pesticides and fertilizers are used, sometimes excessively, which also affect the water quality. The implications of agrochemicals seeping into water bodies both on surface and sub surface levels and their negative effects on humans are well documented especially in infants.

Shahid et al. (2016) identify the contamination of soil and water, and human poisoning due to the use of pesticides in Pakistan. Farmers started using pesticides in 1954, which is currently on the rise. In terms of pesticides most used, Punjab leads all the provinces followed by Sindh, Khyber Pakhtunkhwa, and Balochistan. In Pakistan, the use of pesticides on cotton crop is almost 70–85% whereas rest of
pesticides are used on crops such as wheat, sugarcane, maize, rice, tobacco as well as vegetables and fruits (ibid). These pesticides later become the part of agricultural run-off and ultimately results in contamination of soil and waters. Over 500,000 Pakistanis annually suffer from poisoning due to agro-chemicals, and out of them 10,000 die (ibid).

3.4. Groundwater Quality

The problem of quality impairment is not only limited to surface water as groundwater situation is equally precarious. Groundwater near wastewater conduits is also highly polluted and is unfit for human consumption (Farid et al. 2012). It causes serious concerns for communities and cities that depend on groundwater to meet their drinking water needs.

While gauging the risk of arsenic contamination, Podgorski et al. (2017) finds that groundwater in Pakistan (Indus plain) contains five times more arsenic than World Health Organizations guidelines, making the water unfit for human consumption. The hazard model indicates that much of the Indus plain is likely to have elevated arsenic concentrations, although rest of the country is mostly safe. The study observes that from 50 to 60 million people might be at risk as they are the ones utilizing groundwater for human consumption. The hotspots are around cities of Lahore (Punjab) and Hyderabad (Sindh) having a significant population (Podgorski et al. 2017). The research renewed calls for an analysis of drinking water sources in the country.

4. Impact of Water-borne diseases on Economy

An estimated 250,000 child deaths occur each year as a result of water-borne diseases. Inadequate quantity or quality of water and lack of sanitation facilities result in diseases such as diarrhea, typhoid, intestinal worms, and hepatitis. The cost of drinking poor quality water is estimated at Rs 114 billion yearly. Similarly, 20-40 per cent of the total hospital beds in Pakistan are occupied by patients suffering from water-borne diseases (World Wide Fund for Nature [WWF] 2007). Owing to the unavailability of safe drinking water and sanitation services, the effects are not only seen on human health but also on economy. Environmental degradation costs Pakistan Rs 365 billion a year. About one third of this figure goes to expenditures incurred on health-related costs due to inadequate water supply and sanitation (Mughal 2016).

According to an estimate of Water and Sanitation Program (2006), the inadequate sanitation costs Pakistan Rs 343.7 billion ($5.7 billion) and the total economic cost of poor sanitation is equivalent to 3.94 per cent of GDP of the country. Owing to inadequate sanitation, health impact counts for 87 per cent of the total quantified economic costs followed by productivity losses with 12 per cent share in economic losses. The next section analyzes the interaction between key stakeholders in terms of the concerns addressed above. As such it focuses on the political economy of decision-making.

5. Political Economy Perspective and Past Initiatives:

5.1. Environmental Legislation in Pakistan

Following the Stockholm Declaration of 1972, the Government of Pakistan established the Ministry of Environment in 1975. As per the 1973 Constitution, both federal and provincial legislatures have had the authority to promulgate laws pertaining to environment. However, this changed in 2010 following the 18th constitutional amendment, as a result of which the subject of “Environment and Ecology” was devolved to provinces.
The country’s first environmental legislation, i.e. Pakistan Environmental Protection Ordinance (PEPO), was promulgated in 1983. The primary purpose of this legislation was to establish institutions, which may help set the environmental agenda in the country. These included the Pakistan Environmental Protection Council, the Pakistan Environmental Protection Agency at the federal level along with four environmental protection departments at the provincial level. The key aim of these organizations was to put in effect the provisions highlighted in the PEPO. Later, the PEPO was replaced by the Pakistan Environmental Protection Act (PEPA) after it was endorsed by parliament in 1997.

In 1992, Pakistan participated in the Earth Summit in Rio Di Janeiro and became a party to key international conventions such as the Conventions on Biodiversity, Diversification, and Climate Change. The National Conservation Strategy, which was approved by the government in 1992, provided a framework for encountering myriads of environmental problems facing Pakistan at that time. The strategy recommended action in 14 key programme areas, including protection of watersheds, protection of waterbodies and sustaining fisheries, preventing and abating pollution and managing urban wastes. The mid-term review of the NCS undertaken in 2000 revealed that achievements under the NCS had primarily been focused on awareness-raising and institution building and as compared to bringing a drastic change in the environmental situation of the country.

The National Environmental Quality Standards (NEQS), which were first made public in 1993, specify permissible limits for discharge from industries as well as industrial and municipal effluents. After being revised in 1999, the NEQS became effective in the year 2000. As per the Pakistan Environmental Protection Act (PEPA) 1997, any entity which discharges effluents or emits air or noise pollution in excess of the limits under NEQS is liable to pay a pollution charge to the government. However, governments have been hesitant to implement such laws due to either lack of capacity in terms of monitoring the emissions or due to political pressures.

In the 1990s there was growing awareness amongst the private sector with regard to environmental protection. In this context, organizations such as All Pakistan Textile Processing Mills Association (APTPMA), Oil Companies Advisory Committee (OCAC), Federation of Pakistan Chambers of Commerce and Industry (FPCCI) and Overseas Investors Chamber of Commerce and Industry (OICCI) showed interest to work with governmental and civil society organizations (such as SDPI) for the protection of environment. Moreover, there was an enhanced pressure on the private sector to meet the international environmental protection standards. Yet, the industrial sector was apprehensive of the fines that the federal EPA would have imposed on it for surpassing the environmental standards. Furthermore, the authorities were apprehensive that command and control instruments to control pollution would not be effective. It was in this context that the Self-Monitoring and Reporting Tool (SMART), a computer programme designed to record industrial emissions and discharges, was launched and the industry was taken on board in terms of regularly reporting this data to the EPA. The purpose was to highlight the pollution emanating from the industries with the aim to get it reduced in accordance with the NEQS, without threat of sanctions by the authorities. However, only a small part of the industries actually participated in the project and it was not successful due to the lack of trust between industry and the governmental authorities. The federal and provincial Environmental Protection Departments (EPDs) have lacked capacity as well as political backing of the government to implement fines on industries not meeting the NEQS.

After devolution in 2010, environment became a provincial subject and as such the EPDs in the provincial capitals observed salience. The PEPA 1997 has since been adopted by each of the provinces.
However, the implementation of the legislation particularly as it pertains to wastewater has been severely lacking.

The next section looks at the water and sanitation service delivery institutions in urban and rural areas.

5.2. Water and sanitation service delivery institutions in urban areas

According to the 1973 Constitution, policy, planning, and financing responsibilities lie with the provinces and service provision with local governments (The World Bank 2013). Practically this means that operations are done at the level of municipalities, since water supply and sanitation services are at local levels. However, since environmental pollution and ecology, as a subject, was on the concurrent list (where federal and provinces both have jurisdiction), it fell to the Ministry of Environment to develop relevant policies (Alam 2010). The ministry was involved in devising National Environmental Policy (2005) and the National Sanitation Policy (2006).

After the promulgation of the 18th amendment, the Ministry of Environment was devolved to provinces, so no sole entity at the federal level is now dealing with water and sanitation sector. However, the Ministry of Finance and the Planning Commission of Pakistan do play an indirect role in approving and financing provincial development programmes where projects cost more than $1 million (The World Bank 2013).

Currently, urban water supply operations in small and medium-sized towns are managed by Tehsil Municipal Administrations (TMAs) through Water and Sanitation Agencies (WASAs) in five large cities of the Punjab, one in Balochistan, by the Karachi Water Supply and Sewerage Board (KWSB) in Karachi, and by a new utility being set up in Peshawar for water supply, sanitation, and solid waste (ibid). In Islamabad, the Capital Development Authority (CDA) is responsible for water supply and sanitation schemes. In some cases, the Public Health Engineering Departments (PHEDs) constructs water and sanitation services and hands them over to the Tehsil Municipal Administrations for operations and management. However, the facilities managed by TMAs lack sustainability. PHEDs believe that their jurisdiction ends after the construction of facilities and they are not responsible for operations and management. As a result of this confusion and nonpayment of bills, TMAs are unable to sustain these facilities and in some cases the facilities are permanently shut down. More than 40 per cent of these facilities are either available for the time being or permanently closed. The devolution process intended by the 18th Amendment has been incomplete and fragmented (The World Bank 2013).

The overall impact of the reform can be assessed as positive and in line with the international trends of bringing service provision responsibilities closer to the people, but the implementation challenges have only created uncertainty. This has resulted in the lack of clarity in roles and responsibilities of key agencies and weak accountability, leading to a sector with poor governance overall (ibid).

5.3. Water and sanitation service delivery institutions in rural areas

As discussed above, the 1973 Constitution made the provision of water supply and sanitation services a provincial responsibility. The Local Government Ordinance (LGO) 2001 promoted the decentralization process and sought the abolition of the urban-rural divide, thus prescribed the dissolution of rural water and sanitation institutions — including Public Health Engineering Departments (PHEDs) — at all levels (The World Bank 2013). As a result, the ordinance created TMAs to operate and manage systems in both the rural and urban areas. Certain sections of the ordinance relevant to TMAs and PHEDs are not being followed and consequently a totally different scenario plays out at ground. In practice, the provinces have implemented the
Local Government Ordinance the way they deemed fit or in few cases reverted to some developments made earlier. The Punjab, KP and Sindh provinces reestablished PHEDs in 2003, 2009 and 2010 respectively (The World Bank 2013). These developments created further confusion regarding responsibility and jurisdiction whereas PHEDs are operating in rural areas and TMAs in urban areas. The TMAs lack significant capacity and resources whereas their responsibilities are cumbersome. To address these shortcomings, PHEDs (who have better qualified staff and resources as compared to TMAs) were to assist and support TMAs. After the promulgation of Local Government Act 2012, provinces replaced urban TMAs with municipal corporations and rural TMAs by district councils. Currently, these two methods exist when it comes to rural water supply and sanitation;

1. Provincial or regional level institutions such as PHEDs in Khyber Pakhtunkhwa, Balochistan, and Sindh develop the (water and sanitation) schemes and subsequently operate them.
2. In the Punjab, AJK, and FATA, provincial- or regional-level institutions such as PHEDs develop the schemes, and they are subsequently operated and maintained by community-based organizations (CBOs).

Neither model fully adopts a completely decentralized process down to the village or community level, which is becoming a model internationally as a mean to deliver more sustainable services (ibid).

5.4 The Eighteenth Amendment and its Impact

The 18th Constitutional Amendment was unanimously passed by parliament and notified in the Gazette of Pakistan on 20th April, 2010. The purpose of the amendment was to bring about a paradigm shift in governance from a centralized to a predominantly decentralized federation. As such the provinces were given greater autonomy in terms of policy and decision-making in a wide array of subjects.

Since water and sanitation was already the domain of the Provinces, the 18th amendment did not have any significant impact on the governance system. In fact, the 18th amendment emphasized the need for local governments to develop plans and policies to cater to their needs. The National Sanitation Policy (2006) as well as Clean Drinking Water Policy (2009) remain the guiding documents in this regard.

Following the 18th amendment, the PEPA 1997 was adopted by the provinces with minor changes. As such, the Punjab and Balochistan Environmental Protection Acts were promulgated in 2012 while those for Khyber Pakhtunkhwa and Sindh in 2014. The respective Provincial Environmental Protection Acts cater for a broad array of wastes, including agricultural, hazardous, hospital, industrial and nuclear. Moreover, they explicitly prohibit emissions of wastewater, waste, air and noise pollution exceeding the limits entailed in the NEQS. Moreover, there were calls for setting up of Environmental Protection Councils at the provincial level as per the provincial Environmental Protection Acts. However, only Punjab has set up such a council whose purpose is to enforce the provisions of the Punjab Environmental Protection Act.

The Federal Ministry of Environment (currently renamed as Federal Ministry of Climate Change) was responsible for developing national policies and implementation strategies. It was also responsible for coordinating actions in terms of implementation of environmental laws as well as being responsible for being the focal point for international conventions and protocols.

Following the 18th amendment, the provinces have stopped looking towards the Federal Ministry of Climate Change for direction in terms of environmental decision-making. Moreover, institutional
strengthening projects which used to materialize under the Federal Ministry have now ceased. The Ministry was responsible for collecting data in terms of the environmental situation of the country. However, after devolution such a country-wide exercise did not take place. Another important aspect is the abolition of Federal EPAs role in conducting trans-boundary Environmental Impact Assessment as well as analyzing the impact of surface water and air pollution across provincial and international boundaries. This has resulted in the provincial environmental departments looking ‘inwards’ with regard to these concerns. Lastly, the federal EPA was an avenue for trans-boundary conflict resolution in terms of environmental issues; however this is no longer the case following devolution. There is a concern that trans-boundary environmental impacts, potential conflicts and data collection efforts will be hampered without a national level coordinating agency. There is also a concern that with water being a federal subject, issues pertaining to sea water pollution will not be addressed by the provincial environmental departments.

Devolution also raised concerns for territories such as Azad Jammu and Kashmir and Gilgit Baltistan as the 7th National Finance Commission Award resulted in a decrease in federal budget which heretofore catered to these territories. This significantly impacted the flow of funds to AJK and GB, which affected projects in the water and sanitation domain.

6. Capacity Analysis: Gaps and Hindrances

Some of the key hindrances in terms of progress vis-à-vis deteriorating environmental situation in Pakistan include the ineffective institutional arrangements for effective implementation of relevant laws. Relevant departments have been unable to acquire technical skills and develop capacities so as to sustain the efforts to curb growing pollution levels. Lack of data in terms of the sources of pollution as well as pollution levels continue to hinder an effective response to the situation.

There is only one governmental department across the country that works on water resources research. The Pakistan Council for Research in Water Resources (PCRWR) is an organization, which was set up in 1964. It falls under the Ministry of Science and Technology. PCRWR is mainly a research institution, which conducts research on a broad array of topics related to water management such as irrigation, surface and groundwater management, rainwater harvesting and water conservation. However, the organization is not an implementation agency and as such only caters to collection and analysis of data. Finally, the provincial environmental protection departments lack the human resources necessary to meet the demands of a growing nation. Meanwhile, the need to see economic growth across the country is meant that political elite (many of whom are landed and as such contribute to agricultural pollution or are industrial magnates) continues to stifle initiatives by the authorities concerned.

6.1 Development Prospects

China-Pakistan Economic Corridor (CPEC) is the flagship project under China’s bid for global leadership plan called “One Belt One Road” initiative. CPEC is estimated to be worth, as of 2018, of $60 billion. Sub projects of CPEC include energy, infrastructure, and transport besides the Gwadar Port development. The most important component of CPEC is the development of the industrial zones, nine of which have been prioritized. These Special Economic Zones (SEZs) would ultimately house Chinese industries and enterprises which are planning to relocate to Pakistan (Javed 2017).

Both the governments have also agreed to increase cooperation in sectors such as petrochemical, steel, textile, leather processing, machinery, etc. with specific reference to relocation of industries from China to provincial SEZs. There have been discussions in terms of leveraging the province to province
coordination or sister city arrangements (Kiani 2017). The economic benefits of such an arrangement are quite clear. However, these developments will place further stress on water supply and generate industrial waste, which can enhance the water quality impairment rates already found in Pakistan. Environmental Impact Assessments of most of the proposed projects, as required under Pakistani law, have not been conducted and as such are a cause of grave concern. Furthermore, a Strategic Environmental Assessment of the CPEC project at the outset would have allowed for a more holistic and participatory approach in terms of the sustainability of these project and project locales.

7. Reforms towards a systemic change

Though the 18th amendment and other initiatives to decentralize policy and decision-making in the realm of water and sanitation may have given a certain amount of autonomy to the provinces, it is clear from the above discussion that environmental condition across the country have continued to deteriorate over the past eight years, and the pollution is beginning to impact the health and wellbeing of the population. In this context, this section discusses the active role being played by higher echelons of the judiciary in resolving the environmental crisis in the country.

7.1 Role of the Judicial Bodies: The Case of Sindh

In the light of the impairment and degradation of drinking water in Pakistan, a petition was submitted to the Supreme Court in early 2017 seeking to form a commission to assess the quality of drinking water being supplied in Sindh. The petition voiced concerns regarding the quality of water and absence of an efficient sewage and waste-material disposal system. The Supreme Court ordered the formation of a commission, led by Justice Muhammad Iqbal Kalhoro to assess the situation across the province. The Commission decided to get chemical and microbiological test reports of the water-samples (sub-soil water and surface water) from different areas of the province. The duty was formally handed to Pakistan Council of Research in Water Resources (PCRWR). The results from a total of 336 province-wide samples were (85 samples) 25 per cent safe and (251 samples) 75 per cent unsafe for human consumption (Supreme Court of Pakistan 2017). The inquiry further highlighted the inadequacies of Sindh Environment Protection Agency particularly as they pertained to acute shortage of human and financial resources. The Commission called out the Government of Sindh for not taking any substantial steps to stop the water pollution by treating the effluent through treatment plants. It was also observed that local municipal administrations do not have structural capacity to operate and maintain water supply schemes and infrastructure, resultantly the schemes fail to deliver and the people are left with almost no water to drink.

In December 2017, a petition was filed in the Supreme Court of Pakistan regarding the provision of safe drinking water and sanitation facilities in Sindh. The apex court summoned the Chief Minister Murad Ali Shah and the former Karachi Mayor Mustafa Kamal to brief the court about the state of safe drinking water and sanitation services in the province. Meanwhile, a documentary on the situation was shown in the courtroom. The Chief Justice remarked that human excreta are being deliberately dumped near water pipelines. The Chief Justice was of the opinion that the court will keep on summoning the Chief Minister until and unless the issue is resolved. The Chief Minister, however, maintained that the situation was not as alarming as the documentary portrayed (Tough day for Sindh CM 2017).

A report submitted to the Supreme Court stated that 90 per cent of drinking water samples collected from Karachi were unfit for drinking and the significant quality impairment was due to human waste being dumped in drinking water sources. The Chief Minister, in defense of his government argued that 100 per cent drinking water supplies to Lahore, 73 per cent to Sheikhpura
and 88 per cent to Sargodha contain arsenic, and the court proceedings appear to only single-out Sindh. He added that the provincial government is doing its part to resolve the matter (Shoaib 2017).

7.2 Role of Judicial Bodies: The Case of Punjab

According to Punjab Government, Ravi river is ‘biologically dead.’ It is Punjab’s most polluted river (Pakistan Today 2018). In response to a writ petition filed in the Lahore High Court to redeem and restore its ecology, the court formed a commission in 2011. According to the commission report, some 12,000 to 14,000 small-scale industrial units were dumping liquid, solid, chemical and medical waste into the river (‘River Ravi’ 2016). So far, nothing has been done to take these violators to task. The report stated that the major pollution sources that caused the deficiency of oxygen were household wastewater, industrial effluent, agricultural run-off, and solid waste. The commission recommended the installation of a low-cost bioremediation plant worth $500,000 in Lahore as the first step. Soon afterwards, the Lahore Development Authority proposed a $3 billion waterfront urban development project for the river. The issue is being debated in the court that stalled the progress on the issue (Ahmed 2018).

In the same manner as in Sindh, the Supreme Court, Lahore Registry, heard a petition in February 2018 and took a suo moto notice on the provision of safe drinking water and sanitation services to the masses. The court was presented a report on the dumping of polluted water into Ravi river which revealed that 540 million gallons of polluted water was being drained into the river. It further stated that 480 million gallons of sewerage water and 60 million gallons of water from other sources was drained into the river (Yasif 2018). Consequently, the then Chief Minister of Punjab Shahbaz Sharif was summoned to inform the court about the situation and the actions he took to tackle the water pollution. The chief minister told the apex court that the provincial government would come up with a comprehensive plan for water treatment and provision of safe drinking water for the people of the province (Bilal 2018).

8. Conclusion and Recommendations:

The study highlights that Pakistan’s water resources are being impaired by municipal, industrial and agricultural run-off. At the municipal level, the fundamental shortcoming of the current institutions is the overlapping of institutional jurisdiction (TMA, WASA, PHEDs, District Councils) that makes governance of water sector in urban settings ineffective. With regard to the industrial wastewater which impairs water quality, National Environment Quality Standards (NEQS) have long been in effect but their implementation has been lacking. Agricultural run-off laden with fertilizers/pesticides is also a significant polluter of water for which there is no mechanism or policy in place.

Owing to 18th amendment, coordination is missing between federal and provincial units. In order to tackle water pollution emanating from industry, municipal and agricultural sectors, the EPDs need to constantly monitor, engage and increase awareness regarding water pollution which unfortunately falls short of mark due to lack of capacity.

While the judiciary got itself involved in highlighting the need for action in managing the pollution afflicting the water bodies and environment, effective steps in this regard can be taken only through government action with the support of the industries.

In the light of this, following steps are recommended.
1. A study may be commissioned to understand the impact of 18th amendment across various sectors, and to highlight which sectors have performed ‘well’ and which have not yet. This may help devise a way forward particularly in terms of achieving the targets set in the Sustainable Development Goals.

2. Academia is an integral component of research agenda development. As such the departments concerned should partner with academic institutions in developing a baseline in terms of water quality and pollution levels in water bodies across the country. This information can then be used to develop a strategy for managing water pollution.

3. A plan of action needs to be devised to address the capacity gaps of Environmental Protection Departments (EPDs) as well as Tehsil Municipal Administrations (TMAs) in terms of implementing relevant policies.

4. Capacity building of farmers is also an integral requirement in addressing water pollution concerns that particularly pertain to fertilizer and pesticide usage. Here, the role of agriculture extension system is of essence. Regular monitoring and evaluation of their activities will ensure that they are focusing on working with the farmers and communities in addressing such concerns.

5. Provision of knowledge and technology for the treatment of wastewater by industries is integral to any pollution management strategy. EPDs should work with the industrial sector entities (small, medium and large) to address their concerns. Pilot projects developed by international organizations such as United Nations Industrial Development Organization (UNIDO) should be mainstreamed across industries so as to address this issue.
References


