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LOCAL RESEARCH
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PART I
PUBLIC SERVICE DELIVERY
Research Papers

DECENTRALISATION'S EFFECTS ON HEALTH: THEORY AND EVIDENCE FROM BALOCHISTAN, PAKISTAN

Manzoor Ahmed and Abdul Qayyum

ABSTRACT

The study investigated the impact of decentralisation on health outcomes in Balochistan. It looked at how decentralisation has been [in]effective in improving (worsening) the overall healthcare services in the province. The impact of decentralisation was seen through the National Finance Commission's (NFC) 7th NFC Award and the 18th Amendment to the Constitution. Both initiatives provide fiscal and administrative decentralisation to the provinces in Pakistan. Healthcare service in Pakistan is a provincial subject and any step that helps to improve the capacity of the provinces should supposedly translate into better services of healthcare. After the 7th NFC Award and the 18th Amendment, Balochistan has gained bigger fiscal space and provincial autonomy to improve social services including health. The study used a time series dataset from 1975 to 2020 from federal/provincial/district sources to provide micro-level evidence of static (or otherwise) outcomes in health corresponding to decentralisation. The study compared the public health provision by provincial/subnational government with a centralised government to assess which tier is more effective (or otherwise) in health care provision considering various institutional types in both decentralised and decentralised regimes. The empirical evidence was based on the autoregressive distributed lag (ARDL) regression approach. The findings show that decentralisation did not improve health outcomes such as life expectancy, infant mortality rate, and child immunisation. Instead, it caused an increase in infant mortality in Balochistan. The paper concludes that health outcomes have not improved in post decentralisation despite bigger fiscal space and provincial autonomy and the province has not been able to increase healthcare services with qualitatively better outcomes.

1. INTRODUCTION AND BACKGROUND

Decentralisation is one of the most widespread policy reforms in the world. It is being pursued or has recently been implemented, in many countries across all political systems and income levels. The World Bank estimated that decentralisation was being pursued in 80 to 100 per cent of the world (World Bank, 2012). The interest in decentralisation has further grown recently, with new or deepening reforms announced in countries such as Bolivia, Pakistan, Turkey, France, Japan, Kenya, Cambodia, and India, to name a few (Faguet and Pöschl, 2015; Hooghe and Marks, 2016; Rodden, 2006; Ahmed and Baloch, 2019). The scholarly response to the decentralisation debate has similarly been vast, with hundreds of articles published. For reasons such as data and funding availability and policy interest, most of these studies focus more on the high-income OECD countries. However, most of the world's approximately 190 countries, and hence most of the world's decentralisation, lie outside this thirty-six-country OECD club. Therefore, more research needs to be done focusing on developing countries where decentralisation is adopted as a reform policy.

Decentralisation can broadly be defined as the shifting of obligations, authority, and resources from the centre (federal) to regions/provinces to enable the latter in policy, and financial and administrative planning for better service delivery (Schultz, 2004). Decentralisation has different forms, such as administrative, political, and fiscal decentralisation. Each kind of decentralisation has different features, policy repercussions, and preconditions for success. Various economic, political, and fiscal reasons are behind the adaptation of decentralisation reforms, which considerably vary across countries. The proponents of decentralisation argue that it can foster good governance, help improve the lives of common people by bringing decision-making processes closer to the people, enhance coverage and scope, and the quality of service delivery. Recent literature (see, for example, Faguet and Pöschl, 2015; Hooghe and Marks 2016) on decentralisation indicates that over the past decade, emphasis has shifted away from the analysis of the impacts of decentralisation on macroeconomic indicators towards investigating its human face, i.e., its impact on the social indicators, especially health, education, and other basic local services.

In the decentralisation literature, Pakistan is notably underrepresented. The present paper, therefore, is an attempt to provide some insights into decentralisation as a policy reform in Pakistan. Notably, observing the impact of decentralisation on healthcare and establishing a direct or indirect link (either positive or negative) has been and remains a challenge for both public and social scientists. The paper seeks to add to knowledge

about decentralisation by exploring its effects on health in Balochistan, the largest province of Pakistan. In line with modern research, the paper examines and analyses the effects of decentralisation on health in Balochistan in light of the 7th NFC Award and the 18th Amendment to the Constitution of Pakistan, implemented in 2010.

Decentralisation and fiscal federalism should promote human development for the growth and expansion of people's capabilities and choices. Decentralisation should hypothetically contribute to better health facilities and human development, as the provincial/subnational governments are supposed to he more responsive to the people's basic needs, and effective in services provision if they are more accountable to the local people than the central/federal government.

According to the 1973 Constitution of Pakistan, and further to its 18th Amendment in 2010, health primarily has become a provincial subject. However, planning finance and administration of health were partially conducted by the federation in parallel to the provinces. The federal health department used to set the overall policy planning, coordination and standard for primary and tertiary healthcare before the 18th Amendment (Khan and Mirza, 2011). In the post-10th Amendment, the core reason for devolving health (primary, secondary, and tertiary) to provinces is to improve its provision and quality. Therefore, it is fair to assume that with more fiscal power to the provinces through the 7th NFC Award (the 7th National Finance Commission Award and 18th Amendment are discussed below) the provision of health is likely to improve as any steps that help to improve the fiscal (7th NFC Award) and administrative autonomy (18th Amendment) of the provinces should translate into better health services,

It has been more than a decade since hath these initiatives for decentralisation were taken, so it is imperative to assess how decentralisation initiatives have affected the health sector, which is an important social sector with a significant impact on social and economic development. To the best of our knowledge, this relationship has not been empirically examined within a robust theoretical context. Thus, we examine whether access to healthcare facilities and their quality has improved after decentralisation in Balochistan.

The present paper contributes to the relevant literature by building a theoretical framework, compiling a novel dataset, and highlighting possible policy issues related to devolution and the health sector

Politically, Balochistan, in many ways, has been at the forefront of the decentralisation campaign, and much of the argument for this came in the backdrop of the underdeveloped socioeconomic landscape in the province. Lack of resources and autonomy in Balochistan are cited as key causes for this underdevelopment. The social sector in Balochistan has historically been poor with weak healthcare indicators. However, the issues of autonomy and resource availability have been addressed to a certain extent, if not fully, through the 7th NFC Award and 18th Amendment initiatives.

Therefore, it is pertinent to examine how and to what extent the province has been successful in addressing its healthcare services. The overarching question of the paper, therefore, is the extent to which decentralisation has affected healthcare services in Balochistan. The question is tested using the following hypothesis: Decentralisation, owing to the 7th NFC Award and 18th Amendment, leads to more expenditure/investment on health in Balochistan, which translates into better healthcare-related facilities and outcomes.

The rest of the paper is organised as follows. Section 2 presents a review of the existing literature. Sections 3 and 4 discuss the status of health and decentralisation in Balochistan. Section 5 presents a theoretical framework, and section 6 explains methodology, data, and variables. Section 7 discusses shows descriptive statistics, Section 8 discusses the results, and Section 9 concludes with policy recommendations.

2. LITERATURE REVIEW

Decentralisation

Upto 1945, Australia, Canada, Switzerland, and the USA were the only functioning federal countries in the world, whereas as recently as 2015 some 20 to 30 countries with 40 per cent of the world's population are federal (Anderson, 2015). Ninety-five per cent of democratic countries have elected regional or local governments with different levels of fiscal, administrative, and political decentralisation (World Bank, 2018). Subnational governments in some countries (the USA, Canada, Switzerland, Pakistan, and India) are more autonomous, while in many other countries (Thailand, Spain, Indonesia, and Chile) subnational governments have restricted autonomy (Hooghe and Marks, 2016). Several developing countries have adopted decentralisation as a policy strategy to resolve many compelling political and fiscal problems, and to improve the social and economic service delivery (Bird, 1993).

The question that arises is what is decentralisation. It is hard to give a precise definition of decentralisation. Fesler (1965) considers that decentralisation is rich with conceptual and empirical significance that reflects the dynamic political and fiscal realities, and incremental changes in a society. Scholars believe that the problems related to decentralisation are purely conceptual, and ironically in many developing countries it is proposed and implemented without comprehending its true meaning (Fantini and Gittell, 1973; Rondinelli, 1981). Decentralisation in many ways is used differently in different contexts with distinctions among fiscal, political, and administrative decentralisation, deconcentration, delegation, and devolution (Martinez-Vazquez, 1998; Litvak and Seddon, 1999).

Fiscal decentralisation is broadly defined as the transfer of fiscal decision-making and the authority of planning and management of public functions from the central government (first tier) to subnational governments (regional/provincial/local) (Bahl, 2006). The advocates of fiscal decentralisation assert that because of the absence of a significant spillover effect, the provision of public goods and services by subnational governments increases efficiency (Oates, 1968 and 1972; Ostrom et al. 1993; Qian and Weingast, 1997), which ensures national unity (Litvack et al., 1998). In political decentralisation, subnational governments are given certain political authority within the constitutional framework set by the central/federal government. It largely reflects the power of the subnational entities to allow regional political parties to participate in the electoral process, strengthening the legislature, promoting, and protecting the local public interests (Litvack and Seddon, 1999). Administrative decentralisation refers to the transfer of administrative authority, particularly over the control of the local bureaucracy, implementation of local service provision and financial management at the subnational level. It empowers the subnational governments to deal with their local affairs under a local regulatory framework.

The Process of Decentralisation in Pakistan

Like many countries, in Pakistan, besides other political motives, decentralisation is adopted mainly to empower the provinces and enable them to deliver social services better and improve governance. Decentralisation in Pakistan has empowered the provinces in terms of finance and administrative controls.

Decentralisation in many ways can enhance the harmony among the provinces in Pakistan and can promote coordination between them and the local governments (the third tier), which can help strengthen the overall federal structure.

Table 1: Revenue Sharing Arrangement Under Various Awards

Divisible Pool	(Raisman) NFC Awards											
	51	61	64	70	74	79	85	91	97	02	2006	2010
Income Tax and Corporation Tax	50	50	65	80	80	80	80	80	37.5	37.5	41.5 - 46.25	65 - 57.5
Other Direct Taxes									37.5	37.5	41.5 - 46.25	65 - 57.5
Sales Tax	50	60	65	80	80	80	80	80	37.5	37.5	41.5 - 46.25	65 - 57.5
Excise Duty				80								
Tea	50	60	65								41.5- 46.25	65 - 57.5
Tobacco	50	60	65	80				80			41.5 - 46.25	65 - 57.5
Sugar											41.5 - 46.25	65 - 57.5
Betelent	50	60	65	80							41.5 - 46.25	65 - 57.5
Export Duties									37.5	37.5		
Cotton		100	65	80	80	80	80	80				
Jute	50	100	65	80							41.5 - 46.25	65 - 57.5
Import Duties									37.5	37.5	41.5 - 46.25	65 - 57.5
Succession Duties		100		100					37.7	37.7	41.5 - 46.25	65 - 57.5
Capital Value Tax on Immovable Properties		100		100					37.5	37.5	41.5 - 46.25	65 - 57.5
Petroleum Surcharges									100	100	41.5 - 46.25	65 - 57.5

Gas Development Surcharge									100	100	41.5 - 46.25	65 - 57.5
Divisible Pool Transfers as % of Federal Tax Revenue	12.8	23	35	53.4	29.8	29.8	29.8	35	37.3	37.3	41.50 - 46.3	56 - 57.5

Source: NFC Reports (various years) (Provincial share in %age)

In the 7th Award, the smaller provinces (in terms of population) of Pakistan insisted on the inclusion of indicators such as poverty, backwardness, inverse population density, and poor collection of infrastructure tax on services in distribution criteria for horizontal distribution (see Table 2).

Table 2: Distribution Criteria for the 7th NFC Award (Share in Percentage)

Indicators	Pop.	Poverty/ Backward	Revenue Generation	Inverse Population Density	Grants for Compensation on Account of OZ&T*	Grant for War on Grants for War on Terror**	Share based on the previous award	7th NFC Award
Weight	82	10.3	5	2.7			100	100
Punjab	57.37	23.16	44	4.34			53.01	51.74
Sindh	23.71	23.41	50	7.21	0.66		24.94	24.55
KP	13.82	27.82	5	6.54		1.8	14.88	14.62
Balochistan	5.11	25.61	1	81.92			7.17	9.09

*Grant-in-Aid to Sindh province is equivalent to 0.66% of the net Provincial Divisible Pool and is given as compensation for losses on account of the abolition of OZ&T.** The grant for the war on terror is 1% of the total divisible pool, which is equivalent to 1.8% of the provincial share in the net proceeds of the Provincial Divisible Pool. Source: NFC document (2010) and Nabi and Sheikh (2011)

On 10th March 2010, the 7th NFC was announced with the consensus of all stakeholders, which may rightly be considered a quantum jump towards decentralisation of fiscal resources to provinces. The Award introduced some fundamental shifts in both horizontal and vertical distributions:

- The Award contained an important step towards decentralisation in Pakistan by increasing the share of the

provinces in the divisible pool to 56 per cent in the first year, effective from July 01 2010, and 57.5 per cent in the remaining 4 years of the award. In addition, the collection charges by the federal government, which hitherto had been 5 per cent, have been reduced to 1 per cent. The federal government also relinquished the sales tax on services under federal excise duties to the provinces (Nabi and Sheikh, 2011).

- Alongside vertical distribution, the horizontal distribution has also undergone a major shift. Besides population, poverty, backwardness, resource mobilisation, and inverse population density are used as criteria for the distribution of the divisible pool among the provinces (see Table 2). Though population remains the major criterion with 82 per cent weight, poverty/backwardness, revenue mobilisation, and inverse population density have 10.3 per cent, 5 per cent, and 2.7 per cent weights, respectively, which has increased the share of provinces in vertical distribution. The smaller provinces are receiving a bigger share which has consolidated their deteriorating budgetary positions.

- To compensate the provinces with extraordinary financial difficulties, special considerations have been made in the Award. It is agreed upon that each province would receive 50 per cent of the net proceeds of total royalty from crude oil. In addition to this, Balochistan is set to receive Rs. 120 billion under the head of the Gas Development Surcharge, which the federation owed to Balochistan, in 12 years instalments. Likewise, KP would get Rs. 110 billion in the head of hydel profit in 5 years (Pakistan, 2010).

The bottom line of the 7th NFC Award is that it recognised the federal spirit of Pakistan and conceded the fact that without greater decentralisation provinces would desperately fail in providing social services for which they have constitutional obligations.

The 18th Amendment to the Constitution

The 18th Amendment to the Constitution of Pakistan passed in April 2010 was a historic amendment that sought to decentralise power in important ways. It devolved several key functions to the provinces by abolishing the Concurrent Legislative List in the Constitution and amending the Federal Legislative List. The decentralisation of responsibility and authority provided the context in which various institutional actors renegotiated their roles in a contested space. In light of the 18th Amendment, the provinces further amended their laws, established new institutional frameworks, developed policies and strategies, and built the capacity to effectively discharge their newly acquired responsibilities.

The Concurrent List was abolished. The subjects such as health and education were devolved to the provinces. This represents the extended sphere of provincial autonomy. For provinces, it meant two things. First, they were now required to legislate on these subjects, even if this amounted to changing the federal legislation mutatis mutandis. Hitherto, provinces had mainly relied on the federation for legislation, policy formulation, and regulations on all important matters. After the Amendment, the provinces can frame their own laws, rules, and policies on a plethora of subjects, including health.

The key structural changes brought about by the 18th Amendment are in line with the nature of decentralisation in Pakistan. Articles 141 to 159 of the Constitution delineate the relationship between the federation and the provinces. In this relationship, the difference is that the Concurrent List, comprising subjects on which both the national and provincial assemblies could legislate, has been largely done away with. The 18th Amendment has, therefore, created not only the necessary constitutional framework and administrative responsibilities, but it has also provided a much bigger fiscal space for the provinces to perform all devolved functions. Health was a residual subject and, therefore, fell entirely under the provincial purview.

Decentralisation and Health

Decentralisation of the health sector was implemented in many states as a subsection of extensive health reorganisations or as a priority management policy (Rico & Leon, 2005; Saltman, 2007). The aim and logic of this policy initiative differ widely from country to country, but in the overall extensive process of health decentralisation, the provision of better health services invariably is the key purpose (Saltman et al., 2007; Costa-Font & Greer, 2013). Health decentralisation literature vigorously advocates decentralisation as an effective reform policy for the delivery of public goods, including health care amenities (Robalino & Voetberg, 2001; Asfaw et al., 2007).

The strong demand for health system decentralisation was first raised in the Alma Ata declaration in 1978, which emphasised a greater involvement and engagement of the communities in dealing with their health-related issues. It was assumed that decentralisation, which strengthens the communities' participation, can substantially improve the health service provision to the people at the margin as the lack of the provision of health was typically an equity concern (WHO/UNICEF, 1978). However, the opponents of health decentralisation argued that the process of decentralisation further widens the inequality gap in the provision of health between the privileged and underprivileged communities (Collins & Green, 1994).

Community engagement through state or local governments can increase the access of people to health services and enhance the overall quality of health provision (Saltman et al., 2006). A key purpose of adopting health decentralisation is to make the health provision more inclusive because, in a centralised health system, those who are at the margins are invariably left out (Magnussen et al., 2007). Decentralisation, therefore, can create a better environment for the health system to gain technical and allocative efficiency by strengthening the local/subnational governments, putting a mechanism of checks and balances in place, and promoting a participatory approach to people closer to the decision-making process (World Bank, 2004; World Health Organisation, 2008; Regmi, 2013; Faguet & Poschl, 2015; Bankauskaite & Saltman, 2007; Regmi et al., 2010).

A review study conducted by Saltman et al. (2016) on decentralisation and health equity concludes that decentralisation creates greater local autonomy among regions but generates disparities among them in terms of healthcare. On the other hand, Regmi et al., (2010) argue that the decentralisation of the health sector is important because it aids in providing health services according to the needs of the local people and improves accessibility. Litvack et al., (1998) note that decentralisation can create more comprehensive reforms in fiscal, technical, and administrative aspects of health services. In the 1990s, a radical transformation took place in the health sector in many countries on neoliberal principles, aiming, among other things, to introduce austerity drives, i.e, to cut state expenditures, minimise the role of the state in providing health services, and introduce rivalry and price awareness in the public sector (Bossert & Beauvais, 2002; Bossert et al., 2000). Pursuing neoliberalism ideology, international donor agencies and aid organisations pressured many developing countries to deregulate and privatise to ease government expenditures. These organisations point out inefficiencies in management and malpractices in financial dealing in the prevailing public health system, which failed to deliver good health facilities (Ayee, 1996; Jommi & Fattore, 2003).

Overall, the empirical work on the relationship between decentralisation and its effect on health is sparse, invariably mixed, and inconclusive. However, some of the country-specific work on the impact of decentralisation/centralisation on healthcare outcomes provide interesting insights. For instance, studies conducted by Mahal et al. (2000) on India, Yee (2001) on China, Ebel and Yilmaz (2002) on Argentina, Brazil, Colombia, Philippines, South Africa, and Venezuela, and Habibi et al., (2003) on Venezuela show that decentralisation has significant and positive impacts on overall health outcomes.

Strumpf et al., (1999) note that in many developing countries health planners at the subnational level tend to allocate a small percentage for health services, which dampens the efficacy of decentralisation for health services. However, Schwartz et al. (2002), using a panel of middle-income countries, showed that local public health expenditures had increased after decentralisation, though over time the subnational governments decreased the share of revenue allocated for public health. Based on evidence from 166 countries, Treisman (2002) pointed out that the impact of decentralisation on the percentages of new-born immunised against diphtheria, tetanus, and pertussis and accessibility to medicines depended largely on the income level of those countries. Asfaw et al., (2007) showed that decentralisation had increased the infant mortality rate in India. They pointed out that states with more than 17.1 per cent expenditure decentralisation (an average decentralisation index) performed better in reducing the infant mortality rate. Khaleghian (2003) showed that from 1980 to 1997 in 140 countries and provinces/states, the impact of decentralisation on vaccination coverage of one-year-old children fell under the category of "below average" to "average". He concluded that decentralisation is only good for less developed countries.

Meher and Samina (2018) analysed the impact of decentralisation on public services across selected districts of Punjab, Pakistan, from 2003 to 2014. They found that decentralisation had improved the delivery of health services in the Punjab. Aftab (2019) examined the impact of decentralisation on health in Khyber Pakhtunkhwa. He also found a positive impact of decentralisation.

A lot of scholarly work shows the not-so-undesirable impact of decentralisation on health outcomes. According to most of the studies, disparity among the regions/provinces is a key concern regarding decentralisation's impacts on health (Collins & Green, 1994; Jommi & Fattore, 2003) even though it is expected that decentralisation may increase equity but there is little evidence that supports this argument (Koivusalo et al., 2020). Some scholars emphasise that decentralisation has adverse impacts on health services, given the fiscal and political autonomy imbalances among the provinces, creating variations in the overall methods to manage the health sector among provinces. This argument, nevertheless, is forcefully negated by other works, citing that decentralisation would not create inequities in health services provision (see, for example, Atkinson & Haran, 2004; Uchimura & Jutting, 2009; Regmi et al., 2010). Equity outcomes depend more on the existing political set-up, administrative structures, and policy framework (Alves et al., (2013; Koivusalo, 2017).

The existing diverse opinions based on mixed outcomes leave considerable room for further research on the impact of decentralisation on the health sector. To draw a solid conclusion on this relationship the existing work done is inconclusive. Thus, to further ascertain the impact and (in)efficacy of decentralisation in improving (or otherwise) health services more systematic work is imperative and the present study is an attempt towards this direction.

3. THE STATUS OF HEALTH IN BALOCHISTAN

Access to basic health services is one of the fundamental human rights accorded by the United Nations. The Universal Declaration of Human Rights (UDHR) states that everyone has a right to a standard of living adequate for the health and wellbeing of him/her and his/her family (The UN, Article 25). Pakistan, as a member of the UDHR, recognises the importance of health in its Constitution that 'the State shall secure the well-being of all people by raising their standard of living and shall provide necessities of life, such as food, clothing, housing, education, and medical relief for all such citizens who are unable to earn their livelihood by reason of disease, infirmity, or unemployment' (Constitution, 1973). However, despite the constitutional pledge, the provision of basic healthcare is poor in the country, where a vast majority of the population, particularly disadvantaged communities, are deprived of any access to basic health facilities.

In Balochistan, the structure for the provision of basic health services is either nonexistent or very poor. For example, out of 10,000 pregnant women, about 785 women experience pregnancy-related complications which

have adverse consequences for overall family lives and their earning capabilities. The proportion of mortality is grotesquely high at 600 for each 10,000. Similarly, the newborn child mortality of 128 out of 1,000 shows the quality and quantity of the maternity staff, problems with well-being administration, underage marriages, and other well-being issues (Health Facility Assessment, Balochistan Provincial Report, 2020). Most of the population in the province (more than 70 per cent) lives in far-flung areas that have an urgent need for maternity specialists and well-being administration (MICS, Govt. of Balochistan, 2018).

In Balochistan, during the past 10 years, one million children have died before reaching the age of five. The maternal mortality rate (MMR) is alarmingly high at 785 per 100,000 live births, while the infant mortality rate (IMR) is 97 per 1000 live births. These health-related outcomes are the worst in Balochistan compared to other provinces. Similarly, birth by skilled birth attendants is 18 per cent, birth offices are 16 per cent, and completely inoculated kids are a mere 16 per cent. The physical infrastructure of the health sector is virtually dysfunctional in rural areas, whereas it is in bad condition in towns and urban centres (Government of Balochistan, 2020).

In terms of health facilities and the provision of basic health services, the primary healthcare system, such as where the Basic Health Units (BHUs) and Rural Health Centres (RHCs), plays a critical role. In Balochistan, there are 909 BHUs, 103 RHCs, 82 Maternal Child Care Centres (MCHs), and 575 Civil Dispensaries (CDs) officially registered (PPHI, 2021). Although the physical infrastructure has increased over time, these BHUs, RHCs, and MCHs are either closed or dysfunctional. This is partly because of the non-supply of medicines and other equipment by provincial and district health departments.

In recent years, although the budgetary allocation and physical infrastructure have marginally improved, the already poor health-related outcomes have further deteriorated, which is evident from health statistics. For example, a total of 2018 professional doctors are working in Balochistan for an estimated population of 13.45 million in 2021 (PPHI, 2021), which translates to 6,665 people per doctor. As discussed earlier, other facilities, including the absolute number of BHUs, RHCs, and the number of paramedics and staff nurses have also increased. Thus, apparently, the physical infrastructure and human resources have increased. However, some of the critical health indicators, for instance, infant mortality and child immunisation, which are the barometer to measure overall health outcomes, have deteriorated.

Figure 1: Number of BHUs and RHCsa

■ Number of BHUs ■ Number of RHCs
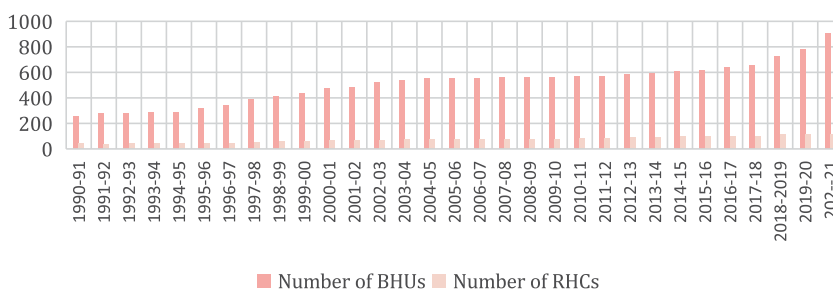
Source: PPHI, Department of Health, Government of Balochistan (2021)

Even though the absolute number of BHUs and RHCs has increased over the years, as observed in Figure 1, the absolute increment may not necessarily correspond to the population growth of 3.37%, which is much higher than the national average of 1.9% (Census Report, 2017). Population per hospital bed is an important variable to gauge the availability of health facilities (Figure 2), which remained constant till 2010. However, after 2010, there has been a steep rise in the population per hospital bed, which is unexpected, given the substantial increase in budgetary allocation to the health sector after the 7th NFC Award.

Figure 2: Population Per Hospital Bed
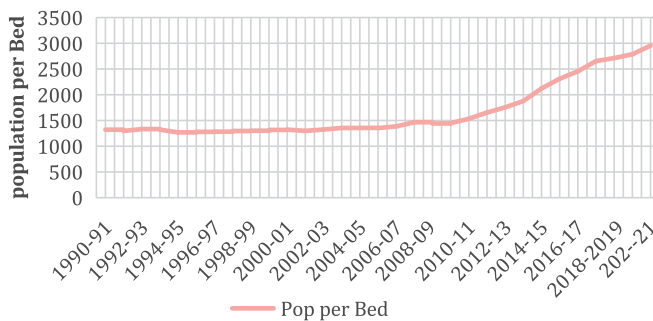
Source: PPHI, Department of Health, Government of Balochistan

Population per dispensary has also increased (see Figure 3) despite an absolute increase in basic units and other health facilities. However, corresponding to population growth 'population per dispensary' lags far behind, indicating a deterioration of public health provision in Balochistan.

Figure 3: Population Per Dispensary
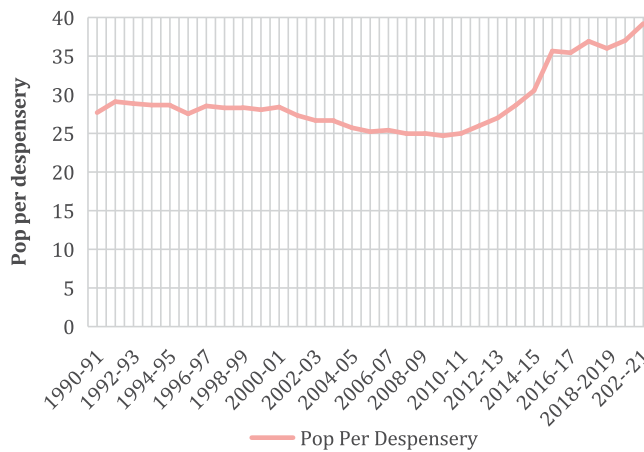
Source: PPHI, Department of Health, Government of Balochistan

Figure 4 shows three important variables, namely, IMR, life expectancy and child immunisation, that can help to evaluate the overall status of public health. As discussed earlier, IMR is widely used as a yardstick to measure overall public health performance. In Balochistan, the IMR witnessed a persistent reduction till 2009, which may be attributed to many of the exogenous factors, but has been increasing since 2009 (Figure 4). Similarly, immunisation coverage has also shrunk in Balochistan. In addition, life expectancy at birth is just around 58 years, which is far behind the national average of 67 years (Economic Survey, 2021-22).

Figure 4: Infant Mortality, Life Expectancy, and Fully Immunised
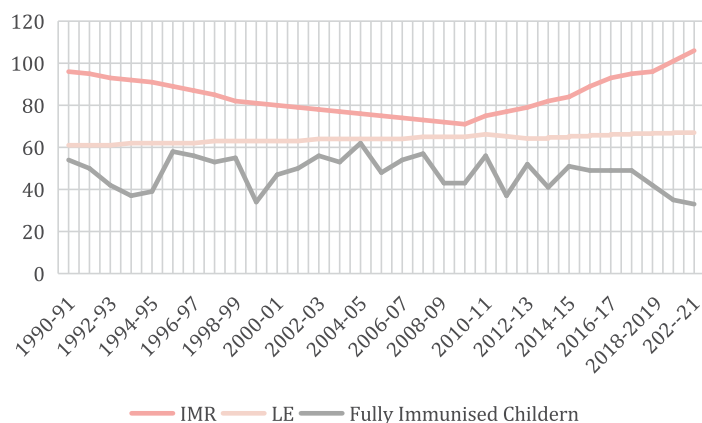
Source: Department of Health, Government of Balochistan

Thus, Balochistan's primary health statistics portray a mixed picture where, on the one hand, the infrastructure and human resources, such as the number of BHUs, RHUs, hospitals, doctors, nurses, etc., have increased over time but, on the other hand, health indicators such as infant mortality rate, children immunisation coverage, and the proportion of pregnant women with prenatal care have deteriorated in recent years.

4. DECENTRALISATION IN BALOCHISTAN

The trend of decentralisation, particularly fiscal decentralisation, had increased before the 7th NFC Award and the 18th Amendment, as we showed above. However, after both reforms in 2010, significant decentralisation took place in all provinces in general and Balochistan in particular. As shown in Table 7 (also see Ahmed and Baloch, 2014), after the 7th NFC Award not only the vertical share of provinces has increased from 41.5 per cent – 46.25 per cent to 57.5 per cent enlarging the overall share of the provinces in the divisible pool – which is a hallmark of decentralisation – but also the horizontal distribution for Balochistan has increased from approximately 5.3 per cent to 9.09 per cent, as more criteria for horizontal distribution along with population, which hitherto had been the sole criterion (table 7).

Table 7: Summary of the Provincial Share in the NFC Award - 1974 to 2010 (%)

NFC Awards	Punjab	Sindh	KPK	Balochistan
NFC Award 1974	60.25	22.5	13.39	3.86
NFC Award 1979	57.97	23.34	13.39	5.3
NFC Award 1885	57.97	23.34	13.39	5.3
NFC Award 1990	57.88	23.28	13.54	5.3
NFC Award 1996	57.88	23.28	13.54	5.3
NFC Award 2000	57.88	23.28	13.54	5.3
7th NFC Award 2010	51.74	24.55	14.62	9.09

Source: National Finance Commission Report, 2010

As Figure 6 shows, expenditures have been significantly decentralised post-7th NFC award and the 18th Amendment.

Figure 6: Divisible Pool Transfer in Balochistan (Rupees in Billion)
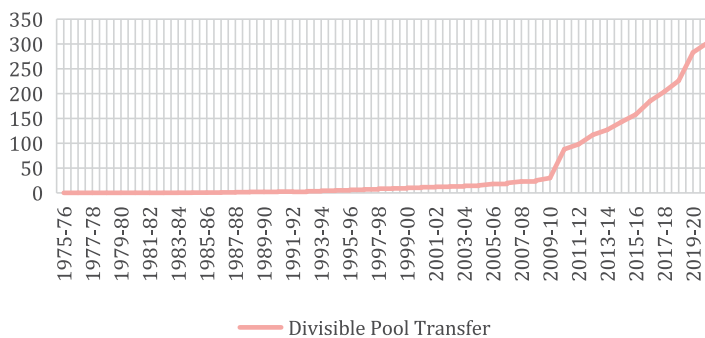
Source: Budget Documents, Ministry of Finance, Government of Balochistan

As Figure 7 shows, a steep rise in all federal receipts, both the divisible pool and straight transfers, after 2010 is a typical manifestation of decentralisation in Balochistan.

Figure 7: Federal Receipts to Balochistan (Rupees in Billion)
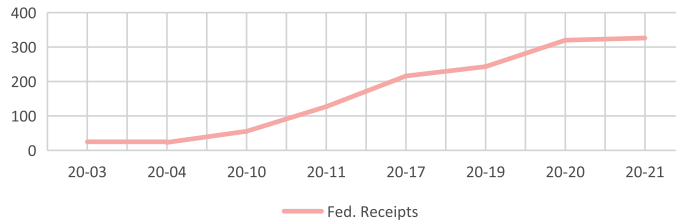
Source: Budget Documents, Ministry of Finance, Government of Balochistan

As shown in Figure 8, expenditure decentralisation in Balochistan has substantially increased, post-2010, displaying a somewhat steep and consistent rise. The implications of the 7th NFC Award are significant in terms of decentralisation in Balochistan as intergovernmental revenue transfers are the lifeline of the provinces. These transfers account for around 89 per cent of Balochistan's public expenditures (Budget Document, 2022-23). Thus, arguably a substantial decentralisation occurred in Balochistan after the 7th NFC Award and the 18th Amendment.

Figure 8: Overall Trend of Expenditure and Revenue Decentralisation in Balochistan – 1975 to 2020
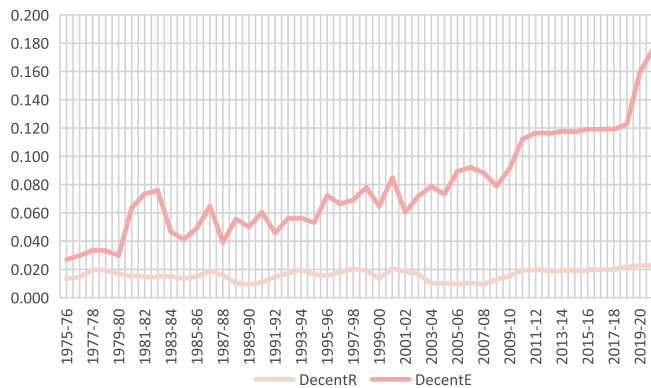
Source: Federal and Provincial Budget Documents (various years; Statistical Yearbook, State Bank of Pakistan (2010); Economic Survey of Pakistan (Various Issues)

Given the above discussion, it is, therefore, pertinent to analyse how this fiscal space is being utilised by the provinces to enhance the quantity and quality of key social services provision including health.

5. THE THEORETICAL FRAMEWORK

This section builds a model and theoretical framework to assess how widespread better quality public health can be provided in a decentralised setup considering various institutional arrangements. Bardhan and Mookherjee (2005), Besley and Coate (2003), Faguet (2002 & 2004), and Lockwood's (2006) existing work provides a benchmark to develop the theoretical framework.

Prima facie, in a federal structure, decentralisation reform is adopted to improve service delivery given the proximity of the subnational governments to the local people and assuming that the local governments are more responsive to the needs of the local people. For the present study, a model is constructed in which the proximity/responsiveness advantage of the decentralisation is compared to the federal government's efficiency parameter, dubbed as 'technological advantage' for the provision of health services.

For simplicity, two regimes are considered, i.e., a centralised regime (C) and a decentralised regime (D). In the centralised regime, there is only the central government, without any provincial or subnational governments. In the decentralised regime, there is a central government and k provinces in which each province governs its respective jurisdiction. It is assumed that every province has two types of inhabitants, namely, poor and rich (or non-poor), and the inhabitants are immobile. In other words, local inhabitants may not fully migrate from one province/locality to another.

The inhabitant of a locality consumes two baskets: public goods (G) and private goods (N).

$$L=f(G,N) \hspace{4cm} (1)$$

Where L is the living condition or the standard of living of the citizen. To maintain L, G and N amount of goods and services is required. The public goods basket, G, also contains public health provision, H. Thus, G is the function of H and X, where X is the set of public goods/services other than H.

$$G=g(H,X) \hspace{4cm} (2)$$

It is further proposed that all basic social services are included in the public goods basket. The basket of private goods, N, is the function of non-necessary/non-basic goods/services, which is denoted by Z.

$$N=n(Z) \hspace{4cm} (3)$$

Furthermore, the first- and second-order conditions of the argument in Equation (1) are:

$$L_G>0 \quad \text{and } L_{GG} \leq 0 \hspace{4cm} (4)$$

Likewise,

$$L_N >0 \quad \text{and } L_{NN} \leq 0 \hspace{4cm} (5)$$

The argument is that when the provision of public goods basket, G, improves, the living conditions of the individual also improve at a decreasing rate (as shown in Equation 4). The same argument is true for the private goods basket, N, in Equation (5).

In addition, it is assumed that the provinces have the perfect knowledge of the people's basic needs for public goods and services characterised as the "Basic Need" parameter, denoted by $\lambda > 0$. This factor gives information to policymakers on the amount of H and Z required to ensure basic social services. Since the decentralised regimes/provinces are closer to the population, and the proximity condition holds, the decentralised setup has an

advantage in terms of the local basic need parameter λ. On the contrary, the centralised regime has a disadvantage in terms of the parameter λ given its remoteness from the population and, therefore, the lack of knowledge about their basic needs. Putting Equation (3), Equation (4), and Equation (5) together given the above arguments, the following valuation function can be derived:

$L=f[λ\ G(H),N(Z)]$ (6)

This function is concave and increasing with respect to H and Z. The function is shown in Figure 9 below.

Figure 9: Relationship Between Living Standard and Goods' Consumption
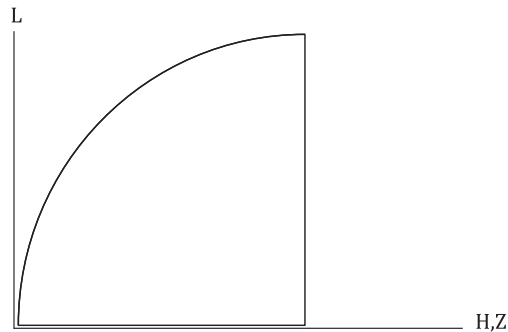
Public and private goods are on the horizontal axis, while the living standard is on the vertical axis. The figure shows that with an increasing amount of public and private goods, H and Z, respectively, the living standard also increases but at a decreasing rate.

The total and marginal utility from G is increasing in λ because of the assumption that the provinces are better situated in realising the "basic needs" than the federation. The estimation of the ability of the federation to people with basic needs may be overestimated or otherwise (Bardhan and Mookherjee, 2005).

The Budget Constraint

Besley and Coate (2003), Basely and Smart (2003), and Lockwood (2006) use the term representative government, which represents the median voters. Corresponding to the people's needs, the representative government is highly likely to provide better H and Z. The representatives are elected through a majority vote, so to ensure reelection they try to satisfy the people by meeting their basic social needs, such as health and education.

It is further assumed that both centralised or decentralised regimes have balanced budgets with revenue, R, and expenditure, E. That is:

This implies that revenues = expenditures or total taxes = total expenditure.

$τ^{i}=w(N+G+Z)$ (7)

In Equation (7), $τ^{i}$ is the total tax for all *i*, where i= 1,2.....n

As noted earlier, there is only one representative government in the centralist regime that decides how much health services H within the basket of public goods, G^, should be provided. The efficiency or cost-effectiveness of centralisation in production and provision of G is captured by the parameter γ.

Reproducing Equation (6) and inserting superscripts i and j, the equation becomes:

$$L = f[\lambda^i\, G(H^j), N(z^j)] \tag{8}$$

Where J = D (decentralised regime), and C (centralised regime).

The private consumption, C^(i), of an individual i is the function of the total number of hours worked, w, minus the amount of taxes τ^i which they must pay.

$$C^i = V(wL^i - \tau^i) \tag{9}$$

Applying the Lagrange and combining Equations (7), (8), and (9), the objective function becomes:

$$\mathcal{L} = \left\{ \sum_{i=1}^{n} \left(\sum_{i=0}^{n} f[\lambda^i\, G(H), N(Z)] + V(WL^i - \tau^i) \right] + \theta\left(\sum_{i=1}^{n} \tau^i - WH - WZ \right) \right) \right\}$$

$$\frac{\partial L}{\partial H} = f_G\, G_P - \theta W = 0 \tag{11}$$

$$\frac{\partial L}{\partial Z} = f_N\, N_Z - \theta W = 0 \tag{12}$$

Equating Equations (11) and (12), the following equation is arrived at:

$$\Rightarrow f_G\, G_H = f_N\, N_Z = \theta W \tag{13}$$

$$\partial L / \partial \tau = -V_\tau + \gamma\, \theta = 0 \tag{14}$$

$$\theta = V_\tau / 1 \tag{15}$$

Combining Equations (11), (12), and (14), and simplifying:

$$(V_\tau\, W)/1 = f_G\, G_P = f_N\, N_Z \tag{16}$$

According to Equation (16), the proportional tax rate, τ^i, on W is equal to the marginal benefit which is extracted from the public goods basket, G, which includes H. In other words, the marginal benefit from goods and services provided by the state is equal to the marginal cost.

Furthermore, we assume that the function f is equal to:

$$f = A\lambda^i\, G^\alpha\, N^\beta \tag{17}$$

In Equation (17), A is a constant, and α and β are the marginal utilities that citizens derive from consuming both baskets G and N, respectively.

$$f_G = \alpha\lambda^i\, G^{a-1}\, N^\beta \tag{18}$$

$$f_G = \alpha\, f/G \tag{19}$$

$f_N = f/N \ (\beta)$ (20)

Furthermore, we assume that:

$C = \ln \boxtimes (\ WL - \tau^i\ )$ (21)

Since it was earlier noted that $\theta = V_t$, substituting (21) for V, Equation (15) becomes:

$\theta = V_\tau / \gamma = (-1)/(WL-\tau)$ (22)

$\theta WL - \emptyset\tau = -1$ (23)

$\tau^i = (1+\emptyset WL)/\theta$ (24)

Thus, τ^i amount of tax is needed per head to finance the provincial public goods and services in either type of government.

Combining Equations (11), (12), and (21):

$$-\frac{W}{\gamma(WL-\tau^i)} = \frac{f}{G^\alpha} * \frac{\partial G^\alpha}{\partial H} = \frac{f}{N^\beta} * \frac{\partial N^\beta}{\partial Z}$$ (25)

Equation (25) depicts the trade-off between a basket of private goods, N, and a basket of public goods/social services, G, that citizens get from a given level of the tax rate, (τ^i, which they must pay as a proportion of the wage rate (W).

Equation (25) further leads to Equations (26) and (27):

(26)

$$\alpha\frac{f}{N}\frac{\partial G}{\partial H} = -\frac{W}{W-\tau}$$ (27)

Assuming that:

$$\beta\frac{f}{N}\frac{\partial N}{\partial Z} = -\frac{W}{W-\tau}$$

$G = H^\gamma$ (28)

$N = Z^\gamma$ (29)

Combining Equations (26) and (27):

(30)

Extracting common factor f from both sides and using Equation (28) and Equation (29):

$$\frac{\alpha}{h^\gamma}\gamma H^{\gamma-1} = \frac{\beta}{H^\gamma}\gamma H^{\gamma-1} \qquad \alpha\frac{f}{G}\frac{\partial G}{\partial H} = \beta\frac{f}{N}\frac{\partial N}{\partial Z} \quad 1)$$

$H = \alpha/\beta\ Z$ (32)

Using Equation (28) and Equation (29) to substitute G and N in Equation (22):

$$\alpha \frac{f}{G}\frac{\partial G}{\partial H} = \alpha A\lambda^i G^{\alpha-1}\gamma H^{\gamma-1}(Z^\gamma)^\beta \ \ yields \Rightarrow \ \alpha A\lambda^i \gamma \ H^{\gamma(\alpha-1)} Z^{\beta\gamma} \qquad (33)$$

Since $H = \alpha/\beta\ Z$, Equation (33) becomes:

$$\alpha \frac{f}{G}\frac{\partial G}{\partial H} = \alpha A\lambda^i \gamma \left(\frac{\alpha}{1-\alpha}\right)^{\gamma(\alpha-1)} Z^{\gamma-1} = \frac{1}{\tau-1} \qquad (33')$$

After having the interior solution of the above equation, Z can be written as:

$$Z = 1/((\alpha A\lambda^{\wedge}i\ \gamma(\alpha/(1-\alpha))^{\wedge}\gamma(\alpha-1)\ ((1+\varnothing WL-\varnothing)/\varnothing))^{\wedge}(1/(\gamma-1)) \qquad (34)$$

Substituting (34) for Z, Equation (33) becomes:

$$H = (\alpha/\beta)/((\alpha A\lambda^{\wedge}i\ \gamma(\alpha/(1-\alpha))^{\wedge}\gamma(\alpha-1)\ ((1+\varnothing WL-\varnothing)/\varnothing))^{\wedge}(1/(\gamma-1)) \qquad (32')$$

The health services provision H by the provinces is a trade-off between the "proximity advantage factor" γ and the federation's "cost-effectiveness" parameter γ.

Assuming assume that marginal utilities of both public and private goods are the same, i.e., α=β and if this condition holds, then Equations (34) and (32') are equal, i.e., H=Z.

Taking the first differential of the above equation with respect to λ and γ:

$$= H\frac{-1}{\gamma-1}\frac{1}{\lambda} \qquad (35)$$

As noted earlier, 0≤λ≤1 and λ captures the proximity advantage of the provinces to the population. In the case of absolute proximity, the parameter λ becomes equal to one (λ=1).

Equation (35) shows how much changes take place in the provision of public health services, H, if the proximity factor λ changes.

The above equation is a concave continuous function and twice differentiable (H_λ>0 and H_λ≤0).

Figure 10 draws on the marginal effect of the proximity advantage, λ, of the local government in public health provision, H decreases as it approaches one (λ→1). The marginal effect of (λ) is higher at point (a) compared to point (b).

The health service, H, is on the vertical axis and the proximity advantage of the provinces, λ, is on the horizontal axis. As λ increases (approaches one), H also increases but at a decreasing rate. As shown in Figure 10, given the marginal benefit of λ , the provision of health services is higher at point (a) compared to point (b).

Likewise,

$$\frac{\partial H}{\partial \gamma} = \frac{H}{\gamma-1}\left(\frac{\ln 1}{\beta A\lambda^i} - \frac{\alpha \ln \alpha}{1-\alpha} - lnH - \frac{1}{\gamma}\right) \qquad (36)$$

γ   denotes the technological advantage or the cost-effectiveness of the federal government in the provision of health services. The same argument applies to the relationship between H and γ as applies to the relationship between H and λ. The above equation shows marginal changes in the provision of H when γ changes, i.e., H increases at a decreasing rate when γ tends to approach one (γ→1).

Figure 10: Relationship betweenPublic Health Provision and Provincial Government Proximity Advantage
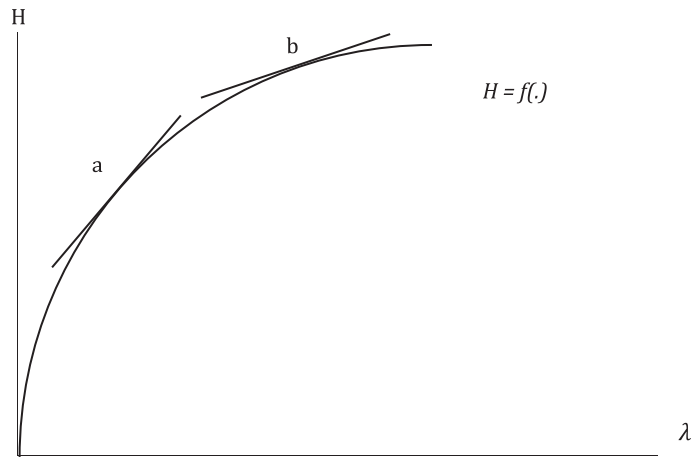
Comparison of the Provision of Public Health Services (H) under Centralised and Decentralised Regimes

The present study compares the provision of health services in both types against the tax rate, τ^i, which individuals must pay in either type of regime. As discussed above, the central government has a technological advantage over provincial governments. The relative technological advantage or cost-effectiveness of the central government in public health provision lies between 0 and 1 ($0 \leq \gamma \leq 1$). When ⍰⍰ approaches 1, the central government has more competency has in the provision of public healt. On the other hand, since the provincial government is nearer to the local people compared to the central government, it has an advantage in estimating the local needs, which is the proximity factor, λ. Furthermore, it is assumed that both types of governments levy the same type of tax, therefore, the tax rate is considered to be equal in both types of government.

Moreover, according to the above discussion, the provision of public health in either type of government depends on their respective advantages, that is, the proximity advantage of the provincial government, and the technological advantage of the federal government. Thus, to compare the centralisation and decentralisation for the provision of health services, the marginal benefit people extract from the H in terms of γ and λ against the marginal cost in terms of the tax rate, τ^i.

Based on the information discussed above, a comparative analysis is undertaken between both types of government for the provision of health services to assess whether decentralisation or centralisation is better for the efficient provision of public health, or whether the combination of both types of governments is preferred.

Table 8: A Comparison of Public Health Provision in Provincial and Federal Governments Based on Equations 35 and 36 in the Model

1.	Preference of the provincial government for the provision of public health	$\left(\dfrac{\frac{\partial H}{\partial \lambda}}{\frac{\partial H}{\partial \gamma}}\right) > \left(\dfrac{\xi}{n_i}\right)$	H^D is preferred to H^C $H^C < H^D$
2.	Preference of the federal government for the provision of public health	$\left(\dfrac{\frac{\partial h}{\partial \lambda}}{\frac{\partial H}{\partial \gamma}}\right) < \left(\dfrac{\xi}{n_i}\right)$	H^C is preferred to H^D $H^C > H^D$
3.	Indifference between the two governments for the provision of public health.	$\left(\dfrac{\frac{\partial h}{\partial \lambda}}{\frac{\partial h}{\partial \gamma}}\right) = \left(\dfrac{\xi}{n_i}\right)$	h^C as preferred h^D $h^C = h^D$

Proposition

The outcomes of the centralisation and decentralisation in the provision of public health may be summarised as follows:

- If the provincial government's proximity parameter (λ), is superior to that of the federal government's technological advantage parameter (γ), the provincial government is preferred for the provision of public health provision.

- If the federal government's technological efficiency factor (γ) outweighs the proximity factor of the provincial government, the federal government is preferred.

- If the proximity factor (λ) offsets the technological advantage factor (γ) of the federal government for the provision of health services, both types of governments are equally preferred.

Discussion of the Model

The optimal provision of public health through either type of government is analysed by comparing the ratios of the cost-effectiveness parameter of centralisation, and the proximity parameter of decentralisation with the marginal cost, individuals must bear in terms of proportional tax (τ^i). Since, marginal cost, in terms of tax, is fixed, (ξ/n^i) remains the same for the entire analysis.

As mentioned in Table 8 (first column), the marginal benefit gained from health services (H) given the proximity parameter, λ ,of decentralisation is higher than the marginal benefit of cost-effectiveness parameter, γ, of centralisation ($\partial H/\partial\lambda > \partial H/\partial\gamma$). In other words, the proximity parameter of the provincial government outweighs the cost-effectiveness, or parameter of the federal government, in the provision of health services, given the equal burden of marginal cost, the provincial government would better target the local needs ($(\partial H/\partial\lambda)/(\partial H/\partial\gamma) > \xi/n^i$). Therefore, people prefer that the provincial government provides health services. The second column of Table 8 shows the opposite results, i.e., the cost-effectiveness parameter of the federal government is higher than the provincial government's proximity advantage parameter in the process of health services provision ($\partial H/\partial\lambda < \partial H/\partial\gamma$). The

marginal benefit from the federal government's cost-effectiveness factor dominates the provincial government's proximity parameter in the provision of health services corresponding to the tax rate $((\partial H/\partial\lambda)/(\partial H/\partial\gamma)<\xi/n^i)$. In such a case, the individuals would prefer the federal government for the provision of health services, suggesting that, if the above argument holds, the federal government is more efficient and competent to provide health services.

Finally, if in case the provincial government's proximity parameter (λ) is as good as the federal government's cost-effectiveness parameter (γ), individuals remain indifferent $((\partial H/\partial\lambda)/(\partial H/\partial\gamma)=\xi/n^i)$. The marginal benefits from the provincial government proximity parameter equal the federal government's cost-effectiveness parameter ($\partial H/\partial\lambda=\partial H/\partial\gamma$). In such a situation, individuals may not be concerned with which type of government provides them health services.

6. DATA, VARIABLES, AND METHODOLOGY

The primary objective of the paper is to examine the impact of decentralisation on health. This is operationalised empirically by conducting a pre-post comparison of decentralisation on health services. The pre-post comparison is feasible because Pakistan's intergovernmental fiscal relations create a strong association and resource sharing between federal and provincial level expenditures on a range of social and economic factors including health. In terms of outcomes, three indicators are used, namely, life expectancy at birth (LE), infant mortality rate (IMR), and immunization coverage (FIC). The LE is a statistical estimate of how long one is expected to live depending on several demographic characteristics and socioeconomic and environmental conditions. The IMR is calculated as the number of deaths in the first year of life divided by the number of live births, multiplied by 1,000. The FIC is defined as children who have received a Bacillus Calmette-Guerin (BCG) vaccination. This BCG includes three doses of the Diphtheria, Pertussis, and Tetanus (DPT) vaccine; three doses of the polio vaccine; and a measles vaccine. A child is fully immunised if they have received these vaccinations within the first year of life.

The LE, IMR, and FIC are used because a large development studies literature agrees that these outcome variables are important indicators of health system performance. Secondly, reliable data are available continuously at the subnational level for a long period of interest for these three indicators. Thirdly, these indicators are calculated in ways that tend to respond more smoothly to policy changes. Finally, the selected indicators are less subject to exogenous shocks and are, thus, far more stable over time than the alternative indicators. Unlike other health indicators, they do not tend to move suddenly with changes in demand or the environment but rather change incrementally in response to policy levers. For example, measures linked to the incidence of diseases like measles, tuberculosis, or diphtheria are subject to biological shocks, leading to demand shocks that may cause indicators to swing significantly even when health policy does not. The LE, IMR and FIC, by contrast, are based on a comparatively stable phenomenon. All these characteristics allow us to link changes in these outcome variables more clearly to changes in policy than interventions against infectious diseases.

For the empirical model, keeping in view the theoretical framework, Robalino et al. (2001), Barankay and Lockwood (2007), Faguet and Sánchez (2014), and Faguet et. al. (2021) are used as benchmark models, where they apply identification specifications to assess the impact of health outcomes due to decentralisation. The empirical model is given by Equation 6.1:

$$HS_t = \beta_0 + \beta_1 PCI_t + \beta_2 HEPC_t + \beta_3\, DPT_t + \beta_4\, DPC_t + \beta_5\, RHCS_t + \beta_6 PS_t + \beta_7\, BHUs_t + \beta_8\, FD_t + LD_t + \epsilon_t \qquad (6.1)$$

HS represents outcomes IMR, LE, and FIC expressed as rates. The PCI and HEPC are per capita income and health expenditures incurred by the provincial health department. The DPT is the divisible pool transfer from the centre

to the province, expressed in billions of rupees. The RHCS is regional health centres in each district across the province. The BHU is the basic health units in rural areas. The DPC is the population per dispensary. The PS is the paramedic staff. The FD is the decentralisation dummy that equals 1 after 2009 and 0 otherwise. Equation (6.1) is in the natural log form to interpret results as elasticity.

A positive (negative in some cases) relationship between healthcare outcomes and decentralisation variables, with statistically significant coefficients, is expected. Any effects of decentralisation terms are, thus, in addition to pure expenditures on health (both recurring and development) effect captured. The Augmented Dickey-Fuller (ADF) unit root test shows that all series are either level [I(0)] or first-difference [I(1)] stationary. Therefore, Autoregressive Distributed Lag (ARDL) regression model is used for the analysis.

7. DESCRIPTIVE STATISTICS

A time series dataset from 1975 to 2020 was constructed for both health and finance indicators in Balochistan. In three separate equations, life expectancy at birth, infant mortality rate, and fully immunised children were regressed on key explanatory variables to assess their impact on healthcare outcomes.

Table 10: Descriptive Statistics

Variables	Minimum	Maximum	Average	Standard Deviation
Pop per Bed	1,269.0	2,954.0	1,635.4	438.7
Per capita Income (Rs.)	2,264.0	4,319.0	3,370.5	596.2
Population (million)	3.6	13.7	7.1	2.6
Population per Dispensary	24.7	39.2	30.2	4.1
Doctor Absenteeism (%)	8.0	51.0	24.7	12.6
Divisible pool transfer	0.1	302.0	47.4	80.5
Number of BHUs	70.0	909.0	391.5	219.0
Number of RHCs	9.0	113.0	55.9	32.0
Per capita health expenditures (Rs.)	10.3	2,322.0	420.7	640.2
Infant mortality rate	71.0	119.0	92.5	14.2
Life expectancy	56.0	67.2	62.2	3.2
Fully immunised children	1.0	62.0	36.7	19.6
Provincial budget (Rs, billion)	0.3	465.5	79.4	121.9
Decentralisation (revenue)	0.01	0.02	0.02	0.00

Decentralisation (expenditure)	0.01	0.15	0.06	0.03
Decentralisation (local)	0.04	0.58	0.23	0.12

The descriptive statistics of all variables based on various data sources are reported in Table 10. The value of overall expenditure decentralisation in Balochistan ranged between 0.01 and 0.15, which illustrates a significant improvement. In revenue decentralisation, Balochistan lags far behind its maximum share in total national revenue was just 0.02%. Another important variable is local decentralisation (devolution), which is expenditure decentralisation to the third tier (local governments) from the second tier (provincial government). It is interesting to note that there was a large dispersion in the devolution variable (Table 10). Three dependent variables also showed much dispersion. The highest variation was observed in immunised children since the maximum value is 62 and the minimum is just 1. Another important variable to report is divisible pool transfer, which was as low as Rs. 1 billion and as high as Rs. 302 billion, which shows better fiscal space made available for the province over time, particularly post-7th NFC Award.

8. EMPIRICAL RESULTS AND DISCUSSION

Based on the statistical results of the unit root test, reported in Table 11, it is confirmed that all series are a mixture of I(0) and I(1) variables, which satisfies the prerequisite condition for the ARDL model.

Table 11: ADF Unit Root Test

Variable	Level		First difference	
	t-Statistic	P-Value	t-Statistic	P-Value
LE	-1.818	0.367	-6.927	0.000
IMR	-1.108	0.704	-1.957	0.049
FIC	-3.200	0.027	-6.063	0.000
PCI	-0.993	0.748	-5.637	0.000
PCHE	0.005	0.954	-5.386	0.000
DPT	-0.479	0.886	-6.743	0.000
RHCS	-2.812	0.065	-7.994	0.000
DOC	-2.075	0.255	-5.465	0.000
ABDOC	-1.197	0.667	-8.231	0.000
DPC	-1.357	0.594	-6.122	0.000

Note: All variables are transformed into natural log

The statistics reported in Table 12 show that the essential conditions of no autocorrelation, no heteroscedasticity, and residual normality are satisfied for all three equations. As shown, the F-statistics are statistically insignificant at a 5 per cent level of significance, confirming no autocorrelation in equations 1 to 3. The BPG test statistics of each equation are statistically insignificant, not allowing to reject the null hypothesis of homoscedasticity at a 5 per cent level of significance. The functional form of each equation is tested using the Ramsey RESET test. At a 5 per cent level of significance, the test statistics confirm the correct order of each equation and unbiased specification. The residuals are normally distributed in all equations.

Table 12 Diagnostic Test

Diagnostic Test	Model 1: IMR		Model 2: LE		Model 3: FIC	
Serial correlation test	F-stats	Prob	F-stats	Prob	F-stats	Prob
LM Test	3.611	0.059	1.365	0.271	0.888	0.422
Heteroscedasticity test						
BPG test	1.036	0.489	1.012	0.462	0.971	0.496
Ramsey RESET test	0.463	0.507	0.438	0.513	1.193	0.283
Jarque Bera test	1.156	0.561	0.860	0.651	2.807	0.246

Table 13 summarises the outcomes based on the ARDL bound test for the three equations of health outcomes. Our estimated F-statistics reject the null hypothesis of no long-run relationship at a 5 per cent level of significance, which shows that there exists a long-run relationship between the health outcomes and explanatory variables.

Table 13: ARDL Bound Test Statistics

ARDL Bound Test Statistics						
Health Indicators	Equation 1: IMR		Equation 2: LE		Equation 3: FIC	
Significance level	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
10%	2.53	3.59	2.53	3.59	1.83	2.94
5%	2.87	4	2.87	4	2.06	3.24
2.50%	3.19	4.38	3.19	4.38	2.28	3.5
1%	3.6	4.9	3.6	4.9	2.54	3.86
Calculated F-Statistics	4.88		10.27		7.74	

ARDL Regression Model

The ARDL regression model is used to regress all three health outcome variables on decentralisation and a range of other control variables using data from 1975 to 2020. As discussed earlier, the 7th NFC Award and the 18th Amendment 2010 were the turning points towards decentralisation in which Balochistan gained not only a bigger fiscal space but also more autonomy in several subjects, including health. A dummy variable of fiscal decentralisation was used in the model besides the divisible pool transfer variable, which captures the nature and size of fiscal decentralisation.

Table 14: Empirical Results on Health Outcome Variables Using the ARDL Model

Selected Model: ARDL (1, 0, 1, 1, 0, 1, 1)						
Long Run Coefficients						
Variable	**Dependent Variable: LE**	**p-value**	**Dependent Variable: IMR**	**p-value**	**Dependent Variable FIC**	**p-value**
PCI	-0.017	0.39	-0.848	0.006	0.649	0.501
	-0.019		-0.263		-0.953	
PCHE	0.023	0.01	-0.092	0.43	1.623	0.001
	-0.019		-0.263		-0.418	
DPT	-0.012	0.03	0.18	0.062	0.043	0.883
	-0.019		-0.263		-0.287	
RHCS	0.035	0.01	-0.764	0.004	3.495	0.002
	-0.013		-0.263		-1.01	
BHUs	-0.014	0.004	0.255	0	0.189	0.792
	-0.013		-0.263		-0.708	
PS	-0.058	0.005	-0.387	0.022	0.644	0.554
	-0.013		-0.15		-1.078	
FD	-0.005	0.361	**0.106**	0.04	-0.329	0.337
	-0.006		**-0.047**		**-0.338**	
LD	0.39188	0.001	**-0.124**	0.02	0.6514	0.007
C	4.588	0	10.224	0.004	-0.329	0.183
	-0.013		-0.047		-0.338	

@TREND	**0.004**	**0**	**0.018**	**0.159**	**-15.109**	**0**
	-0.013		-0.047		-11.09	
Short-Run Coefficients						
D(PCI)	-0.013	0.381	0.045	0.444	0.414	0.509
	-0.013		-0.057		-0.62	
D(PCHE)	0.007	0.482	-0.035	0.316	1.036	0.004
	-0.013		-0.034		-0.329	
D(DPT)	0.013	0.006	0.062	0	0.452	0.028
	-0.013		-0.013		-0.195	
D(RHCS)	0.027	0.009	-0.181	0.002	1.428	0.033
	-0.013		-0.047		-0.641	
D(BHUs)	-0.001	0.854	-0.021	0.219	0.12	0.798
	-0.013		-0.016		-0.465	
D(PS)	-0.03	0.02	0.004	0.957	0.411	0.554
	0.013		-0.071		-0.687	
D(LD)	0.014	0.03	-0.004	0.005	0.411	0.004
	0.012		0.002		0.005	
D(FD)	-0.004	0.37	0.04	0.016	-0.21	0.347
	0.005		-0.015		-0.22	
D(@TREND ())	0.003	0	0.007	0.049	-0.21	0.001
	0.013		-0.003		-0.687	
ECM(-1)	-0.78	0	-0.379	0.027	-0.219	0.001
	0.013		-0.153		-0.687	

Authors' estimates. Note: All variables are log-transformed.

Infant Mortality Rate and Decentralisation

The ARDL regression-based output is shown in Table 14 and the statistical significance is determined using t-statistics, which correspond to the p-value at a 5 per cent level of significance. The results indicate that per capita income, regional health centres and paramedic staff had a significant and favourable impact on the infant mortality rate in Balochistan. However, the fiscal decentralisation, divisible pool transfer, and percentage absence of doctors were not favourable for the IMR in Balochistan. The long-run coefficients of PCI, RHCs, and PS are statistically significant with negative signs, suggesting that a 1 per cent increase in PCI, RHCs, and PS resulted in 0.848 per cent, 0.764 per cent, and 0.387 per cent decrease in the IMR, respectively. The long-run coefficients of FD, DPT etc. are positive and statistically significant, showing that due to decentralisation, the IMR, on average, increased by 0.106 every year. It also indicates that a 1 per cent increase in DPT led to a 0.18 per cent increase in IMR in the long run. Interestingly, the impact of health expenditure per capita (PCHE) is theoretically consistent (negative) but statistically insignificant, which demonstrates that decentralisation was not impactful in reducing the IMR in Balochistan.

The results indicate a consistent behaviour of individual factors as long-run coefficients except for PCI lagged over time. For example, the coefficient of lagged IMR shows that the IMR was dependent on its second-year lag period. A 1 per cent increase in IMR (-2) raised the current IMR by 0.478 per cent, on average. The short-run impact of per capita income shows that, on average, a 1 per cent increase in the PCI in a lagged period increased the current IMR by 0.16 per cent. Furthermore, a 0.06 per cent increase in the percentage of divisible pool transfer increased the IMR rate in the short run. On the other hand, the regional health centre (RHCS), basic health units (BHUs), and paramedic staff (PS) played a major role in reducing IMR in the short run. The findings indicate that a 1 per cent increase in RHCS and PS resulted in a 0.18 per cent and 0.26 per cent reduction in IMR in the short run, respectively. Such effects may differ with time lags. The issue of absenteeism of doctors in Balochistan led to a 0.027 per cent increase in the IMR The dummy of fiscal decentralisation indicates that, in the short run, the impact was the same as in the long run. Decentralisation caused the IMR to rise by 0.04 per cent in the short run. Lastly, the ECM (-1) is negative and significant, indicating that if any disequilibrium was caused in the short run, the equilibrium level of IMR moved towards the equilibrium at about 0.379 speed in the immediate year.

Life Expectancy Rate and Decentralisation

The second key health outcome is life expectancy (LE). The empirical findings show that PCHE and RHCS were positively and significantly associated with the life expectancy rate in Balochistan, while the BHUs and paramedic staff were negatively and significantly associated with the life expectancy rate. Subsequently, per capita income and fiscal decentralisation have negative but statistically insignificant impacts on the life expectancy rate in the long run. Although, in the short run, the impact of PCI, PCHE, and FD was statistically insignificant, the short-run findings indicate that a percentage increase in DPT and RHCS led to an increase in LE of 0.013 per cent and 0.027 per cent, respectively. A 1 per cent increase in PS resulted in a 0.3 per cent decrease in the LE. The coefficient of ECM (-1) is significant with a negative sign. The disequilibrium in the LE equation was corrected by about 78 per cent speed in the following year. This demonstrates a strong cointegrating relationship between LE with independent variables. In a nutshell, it suggests that fiscal decentralisation does not contribute to improving the life expectancy rate in Balochistan.

Child Immunisation Rate and Decentralisation

Along with the IMR and the LE, fully Immunised Children (FIC) is another important and major indicator of healthcare services. The FIC is examined along with corresponding determinants and the results are reported in Table 13. It is noteworthy that adjusting for omitted variable bias by including a ray of control variables such as per capita income (PCI), BHUs, and paramedic staff (PS) did not change the statistical relationship between decentralisation and health outcomes. These variables are positive and statistically insignificant.

The first control variable of interest in terms of decentralisation is the transfer of resources from the federation to Balochistan through the NFC Award, which is shown as the divisible pool transfer (DPT). Like the expenditure decentralisation, the DPT to Balochistan has increased substantially over time. However, in the empirical analysis, the DPT was used as an independent variable and was found to be insignificant in the long run vis-à-vis the FIC in Balochistan. Another important control variable worth reporting is the per capita income, which was insignificant at 1 per cent, 5 per cent, and 10 per cent levels of significance. In the long run, the FIC was positively related to the PCHE, the RHCS, and BHUs. The relationship was found to be highly elastic. A 1 per cent increase in the PCHE, the RHCS, and the DPC leads to an increase in the FIC rate of 1.62 per cent, 3.49 per cent, and 2.36 per cent. The variable of interest, the FD, was negative but statistically insignificant. This illustrates that decentralisation does not have a favourable impact on FIC in the long run.

Additionally, the elasticity of the FIC rate with respect to the PCHE and the RHCS was one in the short run. In contrast to its long-term impact, the DPT had a positive and significant impact on the FIC rate in Balochistan in the short run. The statistical evidence shows that a 1 per cent increase in the DPT led to a 0.452 per cent increase in the FIC rate. But the dummy of fiscal decentralisation was negative and statistically insignificant. Moreover, statistical evidence also shows that the DPC had a negative and significant impact on the FIC rate, showing that in the short run, an increase in per capita dispensaries did not contribute to increasing the FIC rate. This indicates the inefficiency of dispensaries in Balochistan. Lastly, the coefficient of ECM (-1) demonstrates a strong cointegrating relationship between FIC and independent variables. If there was any disequilibrium in the FIC, it was restored at a rate of 63.8% in the following year.

Local Government Decentralisation (Devolution) and Healthcare Outcomes

The local or district governments are at the third tier in Pakistan. In 2001, Pakistan's political governance structure went through a major transformation when the Devolution of Power Plan was implemented, under which public services, including health, were transferred to the local governments. The administrative control of the local governments was given to elected representatives. Almost all social services were transferred from provinces to the district/local tier. The latter was given the wherewithal through a formula-based Provincial Finance Commission (Ahmed, 2016).

The analysis considers the impact of local government decentralisation (devolution) on healthcare outcomes. A dummy variable was included to capture the impact of devolution on health services. The empirical results, reported in Table 13, show that the impact of local decentralisation/devolution, on all three health outcomes was positive and significant.

However, in contrast to some of the empirical literature, according to which decentralisation, from the first tier to the second tier, is shown to be effective in improving health outcomes, the current study's results are mixed. The effect seems to be driven primarily by devolution, i.e., from the second tier to the third tier distinct from provincial decentralised expenditures.

9. CONCLUDING REMARKS AND POLICY RECOMMENDATIONS

A simple theoretical framework was built to compare the role of centralisation and decentralisation in health services provision. The model suggests that decentralisation, given its proximity parameter and accountability factor, may be more suitable for providing health services. Centralisation, on the other hand, is perhaps more efficient in providing health services due to better governance and institutional structure. According to the model's results, due to weak institutional structure and poor governance, the provincial setup can hardly improve the health services provision with better access and quality despite the decentralisation of administrative authorities and financial resources. The model suggests that the provision of healthcare services under a provincial set-up

will be effective only if the accountability mechanism and governance are strong. Otherwise, centralisation is more impactful than decentralisation given its efficiency and technological advancement in the provision of health services.

Second, using data from 1975 to 2020 to examine the effect of decentralisation, it was hypothesised that the health outcomes would improve if the total resource availability to the province increased, which is broadly in line with the literature on decentralisation and healthcare and other social services. In contrast to the existing literature, our empirical findings suggest that decentralisation does not significantly contribute to health outcomes when it comes to infant mortality rates in Balochistan. However, a negative but insignificant relationship was observed between decentralisation and life expectancy rate and immunisation rate in Balochistan. The main reason for this ineffectiveness appears to be weak institutions and governance structure. Moreover, various local factors were found to be responsible. These could be both supply-side and demand-side factors. The supply-side factors could be greater inefficiency in public management or ill-informed decisions, while demand-side factors could be a lack of awareness and lower public demand for health services. An unbiased analysis is required to disentangle these effects and determine which dominates. However, the analysis clearly shows that Balochistan has not made good progress in health services provision despite decentralisation initiatives and better health budgeting.

Third, the empirical results show that in terms of better health services provision decentralisation seems ineffective on all accounts. The relationship between decentralisation variables and healthcare outcomes shows undesirable signs and statistical insignificance. Evidence for this comes from provincial-level time series regressions.

The present study adds to a broader understanding of decentralisation in Pakistan. First, the study adds to the understanding of the effects of decentralisation by undertaking a case study of the provision of health services in a large and important province of Pakistan that had problems in the past with the lack of autonomy and centralisation. Second, the theoretical framework shows that even if the fiscal space is enhanced and allocations to the health sector are increased, a decentralised setup may not be effective in improving public health services provision till the provinces have the requisite institutional and administrative capacity. Third, empirical results provide a solid ground to undertake more qualitative analyses of decentralisation in Pakistan.

The literature on the effects of decentralisation on the provision of social services in the past has reported mixed and inconclusive effects of decentralisation. One reason for the inconclusiveness of the results could be that studies from the 1960s to the 1980s relied on mainly qualitative evidence and compared countries that had sometimes implemented very different types of reforms. However, the availability of higher-quality and more fine-grained data has made possible a newer generation of decentralisation studies that use large-N approaches even at sub-national levels to probe the effects of decentralisation deeply and robustly. As Channa and Faguet (2016) show, the results of such studies are much less ambiguous.

Based on the theoretical and empirical results of the study, the following policy options may be considered:

- To make decentralisation effective for health services delivery, the governance structure at the provincial level needs to be improved, focusing more on the punctuality of the staff working in the health department and utilising the allocated funds efficiently to ensure the availability of equipment and medicine even at the BHUs level. Staff, including nurses, doctors, and paramedics, should be provided regular training.

- To optimise decentralisation for the health services provision, better decision space is required at the sub-national (district level), and the decision space may be accompanied by an expanded capacity and strong accountability.

- For all tiers of government to implement decentralisation, there should be a concerted effort to encourage greater knowledge of the de jure decision space and push all health officials to take responsibility for making decisions aiming at the better performance of health services.

- For synergistic effects, institutional capacity at the provincial and district levels (district administrative units) must be developed.

- Accountability to elected representatives must be insured.

- The development of an accountability mechanism at the local level as a policy objective should be given priority. Moreover, local decision-making with balanced configurations of the decision space must be encouraged along with the strengthening of institutional capacity and robust accountability mechanisms.

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APPENDIX A

Table 9: Variables, Variables Codes, and the Measurement/Definition of Variables

	Variables	Code	Measurement/Definition
1	Pop per Bed	PPB	Hospitals beds available per 1000 people in public hospitals and dispensaries
2	Per capita Income	PC	Per capita income is the gross regional (Balochistan) product divided by midyear population, at constant factor cost of 1980-81.
3	Pop in Million	Pop	Midyear population (in Million people)
4	Pop per Dispensary	PPD	Population per dispensary
5	No of Dispensary	NDP	Total dispensaries in the province each year
6	Number of Doctors/Generalists	NDC	Total number of doctors
7	Absenteeism of Doctor (%)	ABDC	Absenteeism (percentage)
8	Availability of Medicines	AM	The amount given to each BHU for medicines ('000 Rs.)
9	Paramedics staff	PS	Aggregated paramedics in all districts each year
10	Absenteeism of paramedics	AP	Absenteeism (percentage
11	Staff Nurses	SN	Total registered nurses
12	Ministerial Staff	MS	Total supporting staff at BHUs and RHCs and civil hospitals
13	Divisible Pool Transfer	DPT	The share of Balochistan in the divisible pool as per the NFC formula (billion Rs.)
14	Annual Outpatients at BHUs	AOPB	The total annual number of outpatients who visited BHUs
15	Number of BHUs	NBHUs	The total number of Basic Health Units officially operating in all districts
16	Number of RHCs	NRHCs	the total number of Regional Health Centres officially operating in all districts
17	Electrification of BHUs	EBHUs	The number of BHUs supplied with regular electricity

18	Repair, Renovation and Provision of Medical Equipment at BHUs	RMP	Annual grants provided for repair, renovation and the provision of medical equipment to BHUs. ('000 Rs.)
19	Laboratories at BHUs	LBHUs	The total number of laboratories in BHUs
20	Labour Room at BHUs	LRBHUs	The total number of labour rooms in BHUs
21	Washroom/Toilets facility for patients at BHUs	WTBUHUS	
22	Essential Drugs Procured	EDP	Amount of drugs procured for each BHU, RHC and civil hospital (million Rs.)
23	Per Capita Health Expenditure	PCHE	Total health expenditures by the provincial government divided by the total provincial population
24	Infant Mortality Rate	IMR	Total infants who died before reaching the age of five per thousand childer per year
25	Life Expectancy	LE	The number of years a newborn baby would live before its death.
26	Fully Immunised Children	IC	Children received a Bacillus Calmette-Guerin (BCG) vaccination; three doses of the Diphtheria, Pertussis, and Tetanus (DPT) vaccine; three doses of the polio vaccine; and a measles vaccine, and should be fully immunised within the first year of life.
27	The proportion of Pregnant Women with prenatal care or antenatal care coverage rate	WWPC/ANC	The antenatal care coverage rate (or ANC coverage rate) is calculated as the total number of pregnant women attended at least once during their pregnancy by a health professional for reasons relating to the pregnancy, divided by the total number of expected pregnancies during a given period (usually one year) in the catchment area (percentage).
28	Crude Death Rate	CDR	The total number of people who die per one thousand per year
29	Total funds allocated to the health sector - recurring	CTF	Annual funds allocated to the health sector for recurring expenses (billion Rs).
30	Health Development Expenditures	HDE	Annual funds allocated to the health sector for development (billion Rs.)
31	Revenue Decentralisation	DecentR	The ratio of provincial government expenditures to total national (federal + provincial governments) expenditures.

32	Expenditure Decentralisation	DecentE	The ratio of provincial government expenditures to total national (federal + provincial governments) expenditures.
33	Local Decentralisation	DecentL	The ratio of district governments' expenditures to total national (provincial + district governments) expenditures.
34	Devolution Plan Dummy	Dev D	A dummy is included to capture the impact of the 18th Amendment. It takes the value of 1 from 2010 onward and 0 otherwise.
35	Dummy Variable	DM09	A dummy is included to assess the impact of variables pre-decentralisation. It takes the value of 1 from 1975 to 2009 and 0 afterwards
36	Dummy Variable	DM10	A dummy is included to assess the impact of variables post-decentralisation It takes the value of 1 from 2009 onwards and 0) otherwise.

EDUCATION DELIVERY IN POST-DEVOLUTION BALOCHISTAN: A POLITICAL ECONOMY PERSPECTIVE

Rafiullah Kakar, Muhammad Saleem and Bilal Sarwar

ABSTRACT

In the wake of the devolution of education to provinces through the 18th Constitutional Amendment, there has been a noticeable increase in public allocation and spending on school education. Moreover, certain reforms have been introduced in education planning, management, and monitoring. These measures have enhanced the availability of physical infrastructure and reading and writing materials for schools and improved education monitoring. There is also evidence of improvements, albeit marginal, in overall literacy rate and reading and arithmetic skills. Notwithstanding the limited gains, the reforms and increased public spending have not translated into commensurate improvements in schooling and learning outcomes. An analysis of proximate causes indicated that learning outcomes are not improving because the various elements of the education system are not aligned around the goal of learning. In contrast, the expansion of schooling appeared to have remained a strategic objective of education delivery but has not experienced significant improvement either because of the existence of serious policy incoherence among various elements of the education system. Major inefficiencies in education management practices combined with the ineffectiveness of accountability mechanisms across the education delivery chain have undermined the system's ability to ensure the timely and reliable provision of all inputs necessary for enrolling and retaining children in school. Application of the 'political settlement' lens revealed that education outcomes are not recording major improvements because the elite interest is aligned with neither learning nor access. Instead, the elite interest is aligned more around patronage politics. Education delivery is driven by short-term, clientelist, political objectives, which are, in turn, shaped by the highly fragile, exclusive, fragmented, and personalised nature of political settlement.

"I was inducted into this school as a teacher in 2002. Since then, I have been asked questions about attendance and the school environment only on two occasions, i.e., in 2014 and 2021. Other than those two occasions, nobody in the education department has inquired about my performance or achievements at the school. When somebody asks me questions about my performance, I will have some incentive to demonstrate performance. When nobody is holding me accountable, what incentive do I have to perform?"

Head of a middle school in Killa Abdullah

1. INTRODUCTION

The adoption of the 18th Amendment to the Constitution of Pakistan in 2010 is arguably the most important political development in the recent history of the country. Among other things, the 18th Amendment devolved many important functions to the provinces through the abolition of the concurrent list, including school education (Shah, 2012). All key subjects related to school education came under the exclusive legislative and executive jurisdiction of the provinces (I-SAPS, 2012).

In the wake of the adoption of the 18th amendment, nearly all provincial governments have introduced reforms in education management and enhanced financing for education but these reforms have produced partial results, at best (Naviwala, 2016). The slow progress on education and other social sector outcomes has generated a polarising debate on the utility of devolution, with detractors expressing scepticism about the impact of devolution on social sector service delivery (Warraich, 2018). This debate came under the spotlight more sharply during the Covid-19 pandemic when an urgent and coordinated response was required by the national and sub-national governments (TABADLAB, 2021).

This study reviewed and examined the school education management and financing trends in post-devolution Balochistan and employed a political economy approach to understanding why increased financing and improved management framework are not translating into commensurate improvements in education outcomes, notably access and learning outcomes.

2. LITERATURE REVIEW

Decentralisation has become a commonly advocated tool for managing diversity and improving service delivery in low- and middle-income countries (McGarry & O'Leary, 2013). Many countries have devolved a large number of administrative, fiscal, and political functions from central government to sub-national governments. The motivation behind decentralisation has varied across socio-political contexts. In some contexts, decentralisation has been a response to rising ethno-regional tensions, whereas in other cases decentralization has been meant to improve the delivery of basic services (World Bank, 2005). In ethnically diverse countries such as Pakistan, decentralisation efforts are typically introduced to improve national cohesion through better management of social diversity (Lijphart, 1997).

The available theoretical and empirical literature on the impact of decentralisation on public service delivery is mixed and inconclusive. Proponents argue that decentralisation may lead to a reduction in regional disparities and enhanced responsiveness and accountability at the local level (Bardhan and Mookherjee, 2003; Habibi et al, 2001; Faguet, 2004; Fredriksen, 2013). Opponents of decentralisation maintain that it may hinder public service delivery, widen inter-regional disparities, and increase corruption and rent-seeking by local elites (Azfar et al., 2000; Rodriguez-Pose et. Al, 2009; Alegre, 2010; Ahmed et. Al, 2005). Most available evidence draws on examples from single countries and sectors. There is little systemic or robust comparative evidence on

whether or not decentralisation leads to improvements in the provision of health, education, sanitation, and other services. The lack of cross-sectoral and cross-national data makes it difficult to make broad generalisations and causal claims (Robinson, 2007).

In the context of Pakistan, there is a dearth of research work on the impact of the devolution following the 18th Constitutional Amendment on sectoral performance and outcomes. Haroon (2021) analysed and compared the growth recorded in education outcomes and found that improvements in education outcomes were slower in the post-18th Amendment period compared to the pre-18th Amendment period in all provinces except Balochistan where more improvement was observed in the post-18th Amendment period. Zaidi et. Al. (2019) assessed health sector planning, financing, and management across provinces in the post-18th Amendment period and found that devolution led to increased health allocations, better planning, and innovations in governance.

Most traditional approaches seeking to assess the impact of decentralisation on sectoral performance focus on the characteristics and capabilities of that sector alone while ignoring deeper determinants such as the role of informal institutions and de-facto sources of power (Kaffenberger and Spivack, 2022). Furthermore, the traditional approach often treats deficits in service delivery as technical problems in organisational design and implementation that can be addressed through sound technical interventions (Aiyar et. al, 2021).

Nevertheless, recent scholarship, led by political economists, recognises that the roots of the educational crisis lie in both technical and political factors (Wales et al., 2016). The World Bank Development Report (WDR) 2018 revealed that the intractability of education reforms, particularly those related to learning, is explained primarily by the prevalence of unhealthy politics around education that leads to a misalignment between education policies and practices and the goals of learning (World Bank, 2017). Politics largely determines whether or not enhanced fiscal and administrative autonomy will result in the adoption of reforms aimed at improving learning outcomes. Political economy literature has identified many structural factors that may shape the politics around decentralised management of education, including, but not limited, to the quality of prevailing formal and informal institutions (Easterly, 1997), social heterogeneity of population, degree of dominance of social groups (Collier, 2000), and strength of relationships of accountability between citizens, service providers and service-users in the education delivery chain (World Bank, 2005). While a critical analysis of nearly all the afore-mentioned factors is important to understand the politics of education, an approach that integrates these factors into a proper conceptual framework is warranted.

In this regard, an increasingly influential political economy approach is the analytical framework of political settlements advanced by Khan (2018). Khan's approach has proven helpful in understanding how political context can shape the opportunities and barriers to improving education outcomes (Wales et al., 2016). Furthermore, it has also brought to the fore the powerful insight that reforms in the formal institutional processes (such as decentralisation) alone are not enough to improve education outcomes in developing countries. Instead, it suggests that informal forms of politics and deeper power relations also need to be factored in as the latter tend to (mis)shape and influence reforms in formal institutional structures and processes (Hickey and Hossain, 2019). Lastly, the 'political settlement' approach also provides an understanding of the extent to which elites operating at different levels in the education delivery chain can commit to implementing reforms related to the expansion of schooling and improvement in learning outcomes (Hickey and Hossain, 2019).

The new but growing body of literature on political settlements indicates that the impact of reforms in the formal governance structure on educational outcomes is determined primarily by the nature of the political settlement. Wales et al., (2016) applied the political settlement analysis to study education systems in eight countries. They classified these countries into three broad groups depending upon the nature and type of political settlement, i.e., developmental states, mixed hybrid states, and spoils-driven hybrid states. The study concluded that while major improvements in access can be achieved across all three types of political settlements, the prospects for improving education quality are the strongest in developmental states and the poorest in spoils-driven hybrid states. This study also indicated that increased education financing may be a necessary but not sufficient

condition for improving learning outcomes (Wales et al., 2016). Similarly, Hickey & Hossain (2019) employed the political settlement lens to examine the politics of the learning crisis in six developing countries—each of which represented a particular type of political settlement—and found that the commitment and capacity of elites to improve educational outcomes was systemically related to, and shaped by, by the type of political settlement. Problematising the widely-held notion that electoral democracy might be sufficient for creating pressures on governments to adopt much-need reforms in education, this study concluded that in societies characterised by strong patron-client networks, formal forms of politics (institutions of political competition) often interact with informal (clientelistic) politics to generate incentives that undermine, rather than support, elite commitment to better educational outcomes. In contrast, political settlements that are characterised by greater political dominance or lesser elite cohesion and where institutions are organised more along impersonal lines are more conducive to the implementation of reforms aimed at improving learning outcomes.

3. METHODOLOGY

This study followed a qualitative research methodology. Given the complex and multi-dimensional nature of education service delivery, the single case study design was adopted to allow for an intensive and detailed examination of a complex set of factors. Primary data was collected through fourteen (14) face-to-face, semi-structured key informant interviews (KIIs) held with all key stakeholders involved in education delivery (for details, see Annex-I). Purposive sampling was applied based on the characteristics of participants and the nature of the study.

For secondary data, this study relied primarily on official data, budget figures, plans, and reports of the Secondary Education Department and other relevant departments of the Government of Balochistan. Moreover, education sector plans and other policy documents prepared and approved by the Government of Balochistan were also reviewed. Besides, official notifications about reform initiatives were reviewed and studied as well. The list of key secondary sources consulted for this study is provided in the Bibliography section. Moreover, research papers and books on education delivery and management were reviewed. English and Urdu news stories covering education in Balochistan were also used.

Lastly, the insights and observations made by the principal investigator of this study, who was involved as a participant in various education sector reforms, were also reviewed and analysed to understand the informal processes and norms affecting education service delivery.

Data Analysis

Descriptive statistics were used to identify trends and analyse quantitative data on school education's inputs, outputs, outcomes, budgetary allocations, expenditures, and other indicators.

Interviews were recorded in local languages, i.e., Urdu and Pashto, were translated into English and were sorted into different sheets. Thematic analysis was applied to analyse the primary data obtained from KIIs. The findings of the thematic analysis were triangulated with the help of secondary data and participants' observations.

4. SOCIO-ECONOMIC AND POLITICAL CONTEXT

Socioeconomic Context

Balochistan has enormous locational and natural resource potential. The economic growth potential of the province, however, remains untapped. The province has the lowest per capita income and weakest growth performance over the past few decades compared to other provinces. According to the Pakistan National Human Development Report (2020), Balochistan is the only province to have recorded a decrease in per capita gross regional product (GRP) between 1999 and 2019. Furthermore, the report also indicates that the gap between Balochistan and the rest of Pakistan is widening on nearly all indicators of growth and socioeconomic development. Among other factors, an underdeveloped human resource base is one of the most important drivers of weak economic performance.

Balochistan accounts for nearly 44 per cent of Pakistan's total land area but is home to only 6 per cent of the country's total population. According to the 2017 Population Census, the province has a population of 12.34 million, which is scattered over a large swath of arid, inhospitable, and mountainous terrain. Nearly 72 per cent of the total population lives in rural areas. Balochistan has the lowest population density of all provinces (36 per sq km compared to the national average of 261 per sq km). The province has a very young population. Every three out of four people (75 per cent) in the province are below the age of 30, indicating that the province is experiencing a large youth bulge. Similarly, the number of school-aged children is 4.34 million approximately, accounting for more than one-third of the province's total population.

Balochistan's large youth bulge represents both an opportunity as well as a risk for the school education system. On the one hand, it offers a window of opportunity to develop human capital and boost economic growth by ensuring the delivery of quality education and skills to a large number of children, which, in turn, will help them become productive members of the labour force. On the other hand, a youth bulge also means that the education system will have to cope with the entry of a great number of children into schools. If the education system fails to equip children and young people with the skills required by the labour market, then a large number of children may leave schools and young people may remain unemployed and underemployed. In the latter case, the youth bulge may become a demographic time bomb (PNHDR, 2017). Thus, it is vital that education policy and planning account for and prepare for the underlying demographic changes.

Political and Fiscal Context

The political, fiscal, and administrative governance structure of Pakistan underwent a fundamental change in 2010 with the adoption of the 18th Amendment to the Constitution of Pakistan. Among others, the 18th Amendment abolished the concurrent list and devolved nearly all important social subjects to the provinces, notably including health and education (Shah, 2012). All key subjects related to school education that were previously on the concurrent list came under the exclusive legislative and executive jurisdiction of the provinces as a result of the 18th Amendment. These subjects included education policy, curriculum, syllabus, planning, centres of excellence, standards, and Islamic education. Before 2010, provincial governments were responsible for delivering education but major powers concerning policy, planning, resource allocation, and curriculum design rested with the federal government. Besides, the 18th Amendment also enhanced the responsibility of provinces through the insertion of Article 25A in the Constitution, which obligates the State to provide free and compulsory elementary education to all children (I-SAPS 2012).

In addition to devolving social subjects, the 18th Amendment also enhanced fiscal space for provinces by providing constitutional protection to the vertical distribution formula agreed upon in the 7th National Finance Commission (NFC) Award. The 7th NFC Award not only increased and fixed the share of provinces at 58 per cent

but also revised the erstwhile population-based formula for the horizontal distribution of resources to include factors such as poverty, revenue generation, revenue collection, and area. Additionally, the 7th National Finance Commission (NFC) Award excluded general sales tax (GST) on services from the jurisdiction of the federal government and devolved it to the provinces. Balochistan was among the major beneficiaries of the 7th NFC Award as its share increased from 5.11 per cent of the total federal divisible pool taxes to 9.09 per cent.

The enhanced fiscal space made available by the 7th NFC Award and the 18th Amendment had significant implications for education financing. The fact that it coincided with administrative autonomy meant that provincial political leadership were empowered to back up potential reforms and new initiatives in education with increased resource allocation. Provincial political elites had a great opportunity to align education policy, planning, and financing with local preferences and needs.

5. OVERVIEW OF SCHOOL EDUCATION MANAGEMENT AND FINANCING IN THE POST-18TH AMENDMENT PERIOD

Administrative Structure

Balochistan has an elaborate institutional structure for managing education at the provincial, divisional, district, and sub-district levels. Within education, primary and secondary education is managed primarily by the province, whereas higher education is managed jointly by the federal and provincial governments despite it being devolved to provinces after the 18th Amendment. At the provincial level, the Secondary Education Department (SED) is the principal administrative department responsible for policy formulation and strategic planning, coordination and oversight of the overall education system. The SED comprises a secretary, three additional secretaries and their staff and the Policy Planning and Implementation Unit (PPIU), which is also headed by an additional secretary.

The SED is supported by several attached bodies which assist in the management of teachers, data collection, teacher training, curriculum development, textbooks, literacy, and private and religious schools. While the SED is responsible for setting strategic direction and policy priorities, the Directorate of Schools is the key executing body responsible for ensuring the timely availability of all inputs of education at the school level. Other attached organisations look after their specific thematic areas, such as curriculum, assessments, and teacher training.

The Directorate of Schools is supported by six Directorates of Education at the Divisional level. The divisional tiers, in turn, are supported by the district tiers, which are headed by district education officers (DEOs). Each DEO has the support of two deputy DEOs, one each for male and female schools. DDEOs are supported by assistant DEOs at the sub-district level.

In the post-devolution period, a new administrative entity called the Policy Planning and Implementation Unit (PPIU) was established in the Secondary Education Department to steer policy planning and coordinate and supervise reform initiatives. Similarly, the Bureau of Curriculum (BoC) and Provincial Institute for Teacher Education (PITE) were reinvigorated to effectively carry out the devolved functions related to curriculum development and teacher training. Furthermore, a new statutory body, known as the Balochistan Assessment and Examinations Commission (BAEC), was set up in 2016. BAEC was given the responsibility to conduct diagnostic and scale examinations for students of primary and middle levels.

Figure 1. Administrative Structure
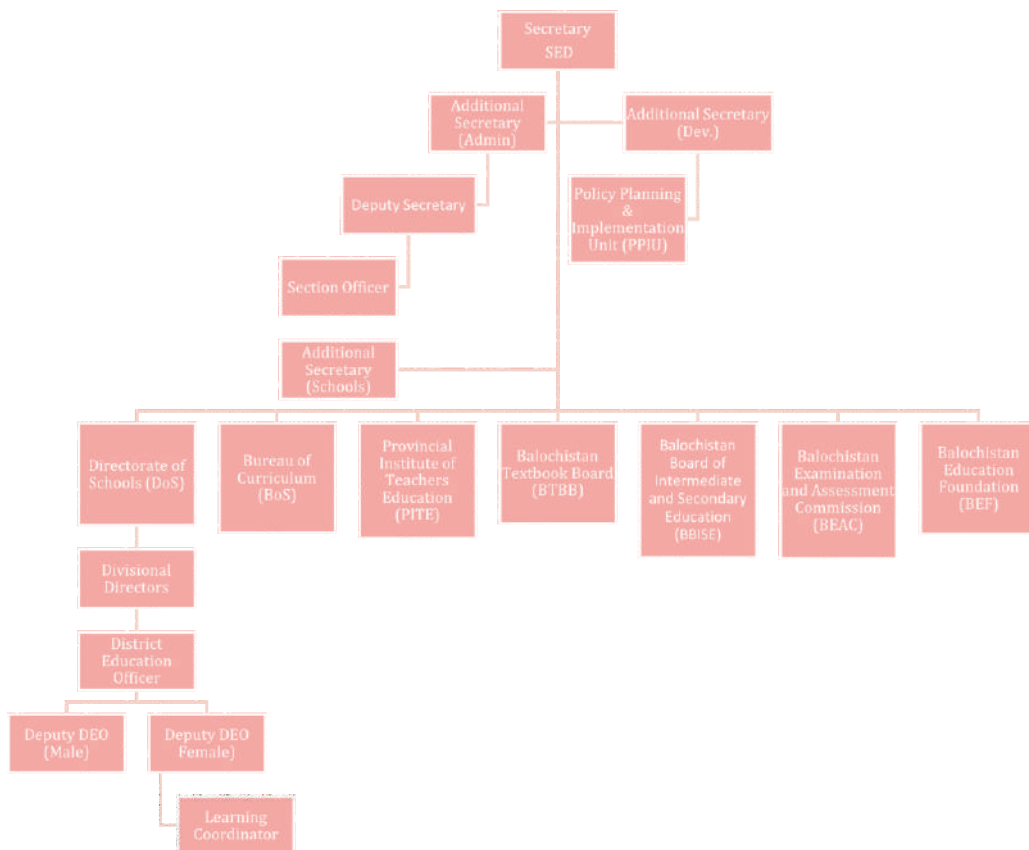
Education Policy and Legal Framework

In the post-18th amendment period, the Government of Balochistan province introduced several reforms in education policy and legal framework. To begin with, the GoB, with the support of development partners, developed and approved five-year sector plans to provide a strategic roadmap and direction for education delivery in the province. By ensuring the availability of a need-based medium-term plan to guide the provision of education, the sector plans improved the strategic planning framework significantly.

In addition to changes in the policy framework, the GoB adopted a number of acts in line with the spirit of the post-18th amendment governance framework. In this regard, the most notable law was the Balochistan Compulsory Education Act 2014 which calls for the provision of free and compulsory education to all children between the ages of 5 and 16. Moreover, certain other new laws were introduced to give legal cover and mandate to specific bodies involved in education service delivery. [1]

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1 Key acts enacted are The Balochistan Introduction of Mother Language as Compulsory Additional Subject at the Primary Level Act 2014; The Balochistan Child Protection Act 2016; The Balochistan Boards of Intermediate and Secondary Education Act 2019; The Balochistan Assessment and Examination Commission Act 2018; The Balochistan Private Educational Institute Registration and Regulation Authority Act 2015; The Balochistan Technical Education and Vocational Authority Act 2011; The Balochistan Essential Education Services Act 2019.

Governance and Management Reforms

In addition to changes in policy, legal and administrative framework, the post-devolution period saw the introduction of many reforms in the management of school education. Key reforms included the devolution of certain financial and administrative powers to district and sub-district tiers and the introduction of a data-driven monitoring system. Major reforms are as follows.

Delegation of Powers to District and Sub-District Levels

In 2014, certain management functions that were previously exercised by the provincial tier were delegated to district and sub-district levels. As part of this effort, new bodies were notified and operationalised at sub-provincial levels, District Education Authorities, District Education Groups, and School Clusters.

- *District Education Authorities (DEAs)*: A District Education Authority was created in each district to exercise powers for the implementation and monitoring of education affairs. Major management functions, such as decisions about teacher training, recruitment, transfer postings up to grade 16, leaves, non-functional schools and teachers' absenteeism, were delegated to the DEA. District Education Officer (DEO) was made the chairman of the authority.

- *District Education Groups (DEGs)*: District Education Group was constituted in each district to coordinate and synergise inputs for operational planning, implementation, and monitoring at the district level. It is primarily a stakeholder forum that includes members of education, health, treasury, and social welfare departments and representatives of teachers, PTSMCs, local NGOs, and civil society. The DEG is headed by the deputy commissioner (SED, 2013).

- *Cluster-based Procurement System*: The function of procuring education resources like reading and writing material, furniture, and mats for schools was devolved to a newly created sub-district management entity called 'cluster' (Alif Ailaan, 2018). All existing primary and middle schools were categorised into groups based on geographical proximity and were linked with adjacent high schools. The procurement function for primary and middle schools was placed at the disposal of Local Education Purchase Committees headed by the principal/headmistress of the high school, who also acted as the head of the cluster (SED, 2014). Previously, the process of procurement was centralised, resulting in mismanagement and embezzlement of resources and limited redressal of the needs of schools.[2]

Establishment of Performance Management Cell (PMC)

To improve monitoring, the education department, in line with the recommendations of the BESP 2013-18, established a 'Performance Management Cell' to collect, process, and analyse data related to key education inputs and outputs. The PMC comprised three pillars, namely the introduction of the Education Management Information System (EMIS), Real-Time School Monitoring System, and Complaint Management System (CMS) (SEDb, 2014).

- Education Management Information System (EMIS): EMIS is primarily responsible for data gathering and management in the education sector. EMIS has created a rich data-base with reliable information on enrolment, number of schools, state of school facilities, and detailed profiles of students, teachers, and non-teaching staff in government schools.

- Real-Time School Monitoring (RTSM): To ensure and improve the monitoring of schools, the education

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[2] 1n FY 2011-12, PKR 400 million were allocated and spent on reading and writing materials for schools. There were serious reports of misappropriation and an inquiry was conducted by the National Bureau of Accountability (NAB). For details, see Procurement Policy 2014.

department, with support from UNICEF and GPE-BEP, implemented an Android-based, real-time school monitoring system, which provides quick updates and feedback about key educational inputs to education managers. Through this initiative, every school is now monitored in real time. It monitors schools on multiple indicators including the presence of teaching and non-teaching staff, student attendance, availability of basic facilities and infrastructure, the status of cluster-based procurement, and the school learning environment (SEDb, 2014).

• The Education Department also set up a Complaint Management System (CMS) that accepts complaints about education facilities, teacher and staff absenteeism, education managers, financial matters, and student admissions. Progress against these complaints can be tracked online. These complaints are processed and stored in a centralised database.

Establishment of Community Engagement Forums

To engage parents and the community in the affairs of schools and promote social accountability, several stakeholder forums were created. These forums included the Local Education Group (LEG), District Education Group (DEG), Local Education Council (LEC), and Parent Teacher School Management Committee (PTSMC) at the provincial, district, cluster, and school levels (SED, 2015; SEDb, 2015;). These forums involved parents, civil society representatives, school heads, officials of the education department, and other relevant government officials.

Education Financing Trends

The introduction of policy reforms and the legal and management framework of school education was supplemented and backed by increased budgetary allocations for education. A basic review and analysis of education financing trends are given below.

The overall education budget of Balochistan has recorded a substantial increase in the post-devolution period. In nominal terms, the education budget of the province increased nearly seven times between 2009-10 and 2021-22, increasing from PKR 13.8 billion to PKR 90 billion approximately (Figure 2). The highest annual growth rate of 43% was recorded in 2013-14 when a newly-elected government came into power through what were the first general elections to be held post-18th Amendment.

The percentage share of education in the total budget of Balochistan has also increased. The average share of education in the overall provincial budget averaged 18.24% during the period 2013-2021 compared to 14.57 per cent between 2007 and 2012 (FD, 2008-2021).[3] The share of education in actual public spending at the provincial remained marginally higher (19 per cent) than budgeted allocations (Figure 2).

The current budget, which consists of salary and non-salary expenditures, has traditionally accounted for a major chunk of the education budget. A comparison of the pre-devolution (2007-12) and post-devolution (2013-21) budgets reveals that the percentage share of the recurrent component in the education budget dropped by 6 percentage points in the latter period, declining from 86 per cent to 80 per cent, on average (Figure 3). The most substantial fall was recorded in 2013-14 and 2014-15 when the share of the current budget was reduced to 70 per cent and 71 per cent, respectively (FD, 2008-2021).

The salaries of education employees have also increased significantly over the past ten years. For details, see Figure 4.

The development budget for education follows the same pattern as the overall education budget. In nominal terms, the development budget for education increased eight times between 2009-10 and 2021-22, increasing from PKR 2.3 billion to PKR 17.93 billion (P&DD, 2008-2021). In terms of share of education in the total

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[3] 2012 has been chosen as the cut-off year as the first general elections under the post-devolution governance structure were conducted in 2013. Besides, data is not available for the pre-2007 period.

development budget allocations, it hovered around 11 per cent during 2007-12 and rose to 14 per cent, on average, during 2013-21. The share of education in actual spending is even greater in the post-devolution period, increasing from 9 per cent to 16 per cent, on average, between 2007-12 and 2013-20. The highest allocation for education was recorded at 24 per cent and 23 per cent in FY 2013-14 and FY 2014-15, respectively (Figure 6).

The utilisation rate of development expenditures on education has also improved in the post-devolution period, indicating enhanced capacity to spend the allocated budget. The average spending rate of the development budget increased from 83 per cent during 2002-12 to 92 per cent during 2013-2020, on average. While the cumulative average shows improvement in the public financial management capacity of the province, year-wise figures show that spending capacity continues to be constrained. The lowest rate of spending was observed at 47 per cent, 68 per cent, and 71 per cent, respectively in 2018-19, 2019-20, and 2013-14. This is partially explained by weak, unrealistic, and politicised public financial management practices and partially by issues of litigation and political instability. Figure 5 looks at the allocated and spent development budget for education from 2002-03 to 2020-21.

Comparison with Global Education Financing Benchmarks

The increased allocation for education post-2012 indicates the willingness of the provincial political leadership to invest in education. This level of spending on education is not far from the global financing benchmarks for education set by the international community for achieving Sustainable Development Goal 04. According to the Education 2030 Framework for Action, governments should allocate at least 15% to 20% of public expenditure to education (Mundial, G.B. & UNICEF, 2016). In 2018-19, for example, the share of education spending in the total budget in low-income countries was around 15 per cent (Al-Samarrai, et al., 2021).
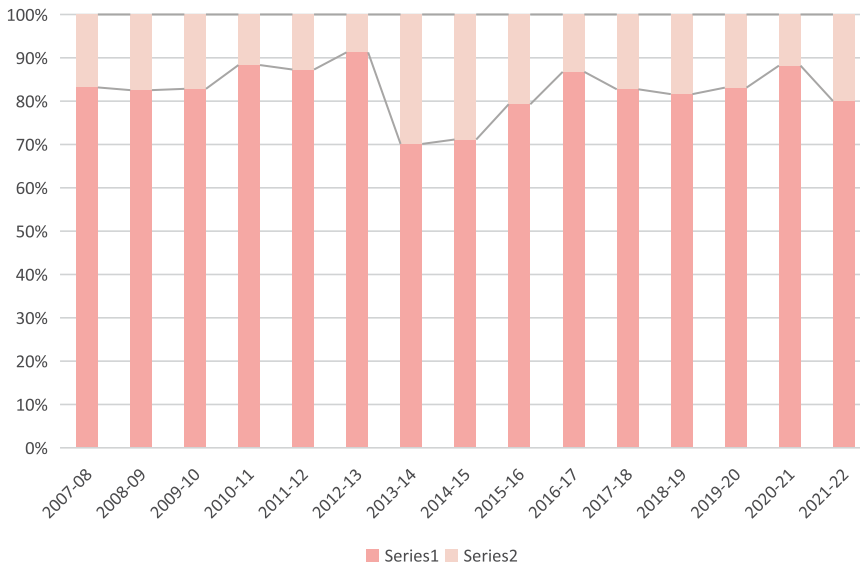
Figure 2. Share of Education Budget in Total Provincial Budget
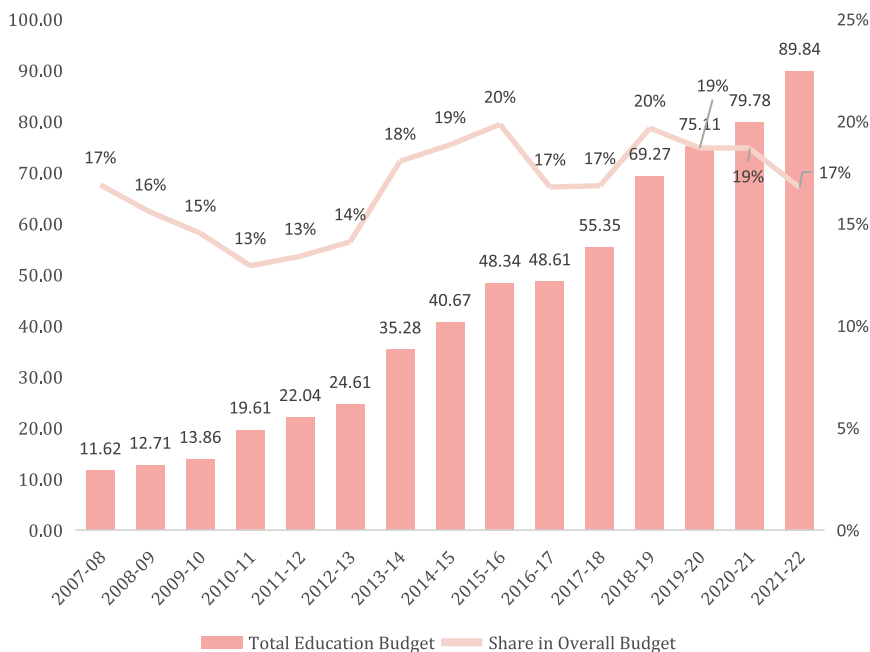
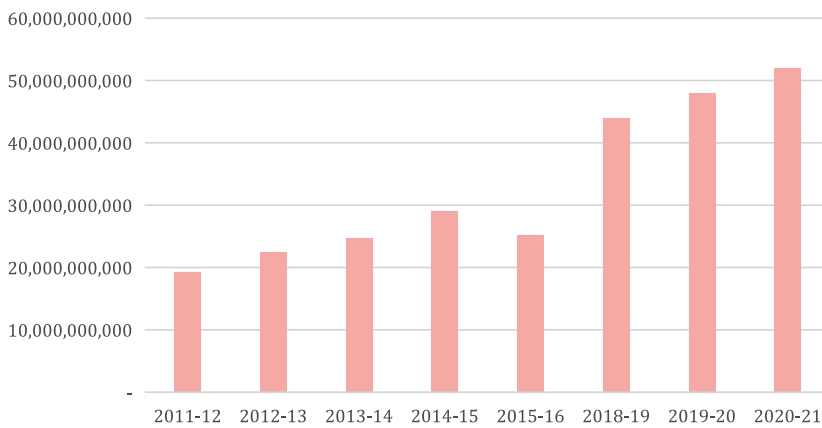*Source: Annual Budget Statements and Budget Books FY 2007 to FY 2021-22.*

Figure 3. Share of Development & Non-development Component in Education Budget

Source: Annual Budget Statements and PSDP Abstracts FY 2007 to FY 2021-22.

Figure 4. Salary Budget of Employees of the Secondary Education Department
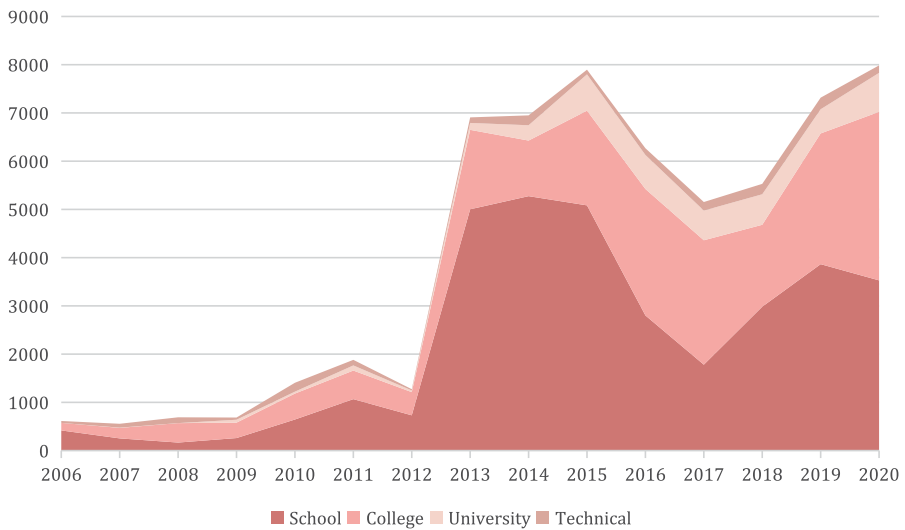

Source: Budget Books FY 2007 to FY 2021-22.

Figure 5. Share of Education in Total Development Budget (BE & RE)

Source: Annual Budget Statements and PSDP Abstracts FY 2007 to FY 2021-22.

Figure 6. Sub-sectoral breakdown of the Development Budget

Source: Annual Budget Statements and PSDP Abstracts FY 2007 to FY 2021-22.

6. REVIEW OF EDUCATION OUTCOMES IN POST-18TH AMENDMENT

Access and Attainment Indicators

Over the past few decades, the world has seen a dramatic expansion in access to schooling and attainment for children. Even the majority of low- and middle-income countries have been able to ensure schooling for nearly all children (World Bank, 2018).

While education systems across the world have almost successfully addressed access-related issues, Balochistan continues to face alarming schooling as well as learning crisis. According to calculations based on data from the Population Census 2017, Balochistan has 4.64 million children between the age of 5 and 16 years in 2020. Of these, only 1.70 million are enrolled in schools and madrassahs, whereas staggering 2.97 million children remain out of school, accounting for nearly two-thirds (63 per cent) of the total number of children. The proportion of out-of-school children in Balochistan is the highest compared to all other provinces of Pakistan. The situation is even worse for girls as more girls are out of school than boys. Low retention and school completion rates contribute to a large number of children remaining out of school. Data on primary and secondary enrolments indicates that only 15 out of every 100 children enrolled in primary grades make it to grade 10 (SED, 2021).

Of the enrolled children, nearly 1 million are enrolled in public schools (SEDb, 2021), whereas 0.576 million and 0.125 million are enrolled in private schools and madrassahs, respectively. In other words, the public schools, private schools, and madrassahs respectively account for 59 per cent, 34 per cent, and 7 per cent of the total enrolment.

Learning Indicators

The more alarming aspect of the education crisis is that the majority of the nearly two-fifth of children who do attend schools are not learning either. For most of these children, schooling does not lead to learning. Notable manifestations of the learning crisis are a stagnant literacy rate and poor reading, writing, and numeracy skills. The overall literacy rate of the 10 years and older population is 46% in Balochistan compared to the national average of 60% as per the 2019-20 PSLM data. Similarly, student learning outcomes are very poor. According to the Annual Status of Education Report (ASER) 2019, only 37.4 per cent of children in grade 5 could solve grade 3 level subtraction problems and 48 per cent of grade 5 children could read an Urdu story of grade 3 level in rural Balochistan. There are wide gender disparities as more girls are unable to read, write, and solve basic arithmetic problems than boys (ASER, 2019).

Trend of Education Outcomes Over Time

The increased public spending and reforms in education planning, management, and monitoring in the post-devolution period have improved the availability of physical infrastructure, reading, and writing material for schools and data on school inputs. Consultations with heads of schools revealed that the devolution of the procurement function to cluster has significantly enhanced the availability of reading and writing material for schools although room for further refinement remains.[4] Similarly, the strategic planning and data regimes have improved significantly. However, these gains have not translated into significant improvements in access, attainment, and learning outcomes.

To begin with, most access indicators have either remained stagnant or recorded marginal decline with minor exceptions. For instance, enrolment in public schools as a percentage of total school-age children remained

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[4] Interviews with heads of middle and high schools in Killa Abdullah.

stagnant at around 22% between 2014 and 2019 (Figure 7). In other words, the share of out-of-government-school children has remained largely unchanged, averaging 78 per cent. Similarly, the percentage of out-of-school children has not recorded any major reduction either. Moreover, the gross enrolment ratio for primary age recorded a marginal decline from 74 per cent in 2010 to 70 per cent in 2019 (PBS, 2021). Similarly, GER for matric also fell from 38 per cent in 2010 to 37 per cent in 2019. Only GER middle increased from 35 per cent in 2010 to 40 per cent in 2019 (PBS, 2021). However, even for this indicator, the rate of progress remains higher in the pre-devolution period compared to the post-devolution period. The literacy rate (10 years and older) also increased by 5 percentage points in the post-devolution period (PBS, 2021).

ASER reports on learning outcomes of the past decade paint an encouraging picture of learning outcomes in rural Balochistan post-devolution. These reports indicate that Urdu and local language reading skills have improved at the primary and middle school levels. In contrast, English reading skills registered moderate improvement at primary, middle, and matric levels after 2010 (ASER, 2019). Similarly, the arithmetic skills of students in rural Balochistan recorded significant improvements at the primary, moderate improvement at the secondary level, and deterioration at the matric level. The improvements in reading and arithmetic skills at the primary and middle levels are a positive sign. The stagnancy or even deterioration of learning outcomes at the high school level is worrying. However, these findings need to be treated with caution as they are sample-based and include private schools as well.

Figure 7. The Proportion of School-Age Children Enrolled in Public Schools (%)
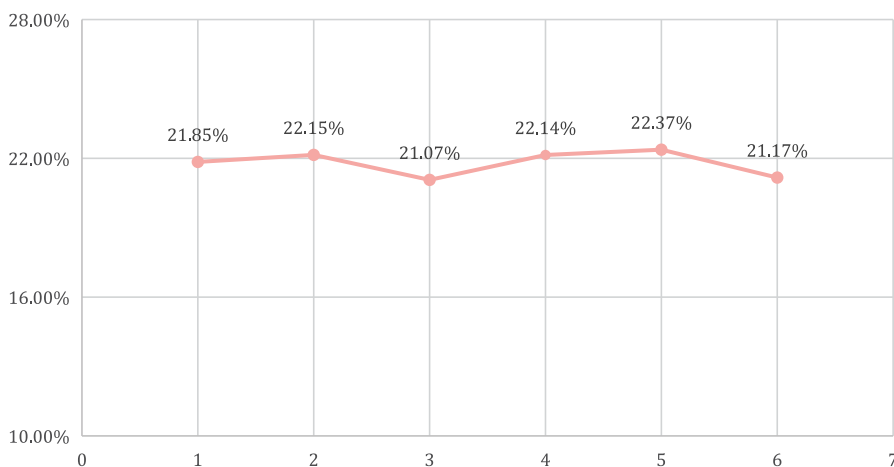
Source: EMIS 2014 to 2021.

Figure 8. Literacy Rate (10 years & older)

Literacy rate (10 years and older) — Pakistan — Balochistan
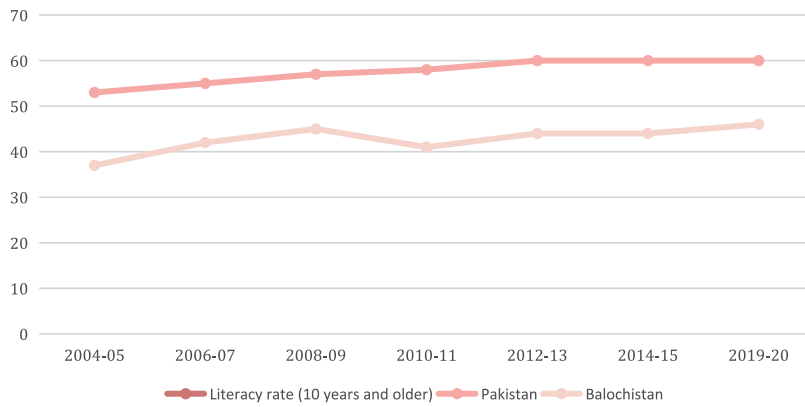
Source: PSLM 2004-05 to 2019-20

Figure 9. Gross Enrollment Ratio (GER) Primary

GER Primary Age (5-9 Years), Class (1-5) — Pakistan — Balochistan

Source: PSLM 2004-05 to 2019-20

Figure 10. Gross Enrollment Ratio (GER) Middle

GER Middle Age (10-12 Years), Class (6-8) — Pakistan — Balochistan
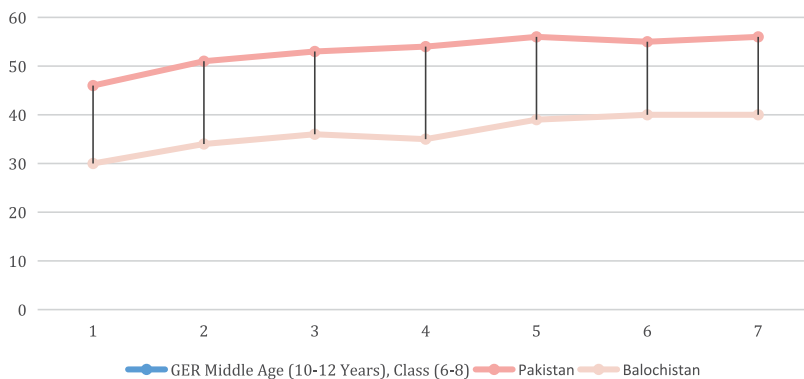
Source: PSLM 2004-05 to 2019-20

Figure 11. Gross Enrollment Ratio (Matric)

Source: PSLM 2004-05 to 2019-20

Figure 12. . Students Who Can Read Urdu/Pashto/Sindhi Sentences (Balochistan Rural)
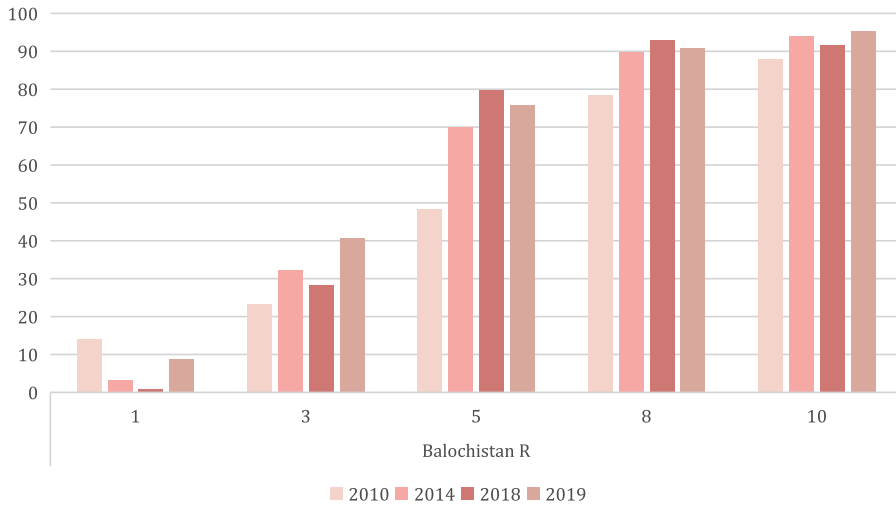
Source: ASER Reports 2010 to 2019

Figure 13. Students Who Can Read English Words (Balochistan Rural)

Source: ASER Reports 2010 to 2019

Figure 14. Students Who Can Subtract Two (02) Digits (Balochistan Rural)

Source: ASER Reports 2010 to 2019

7. MAKING SENSE OF SLOWLY MOVING EDUCATION OUTCOMES: A SYSTEMIC AUDIT

The previous section highlighted that the increased public spending and reforms in education management have not translated into commensurate improvements in access, attainment, and learning outcomes. Nevertheless, limited gains have been observed in reading and arithmetic skills and overall literacy rate. More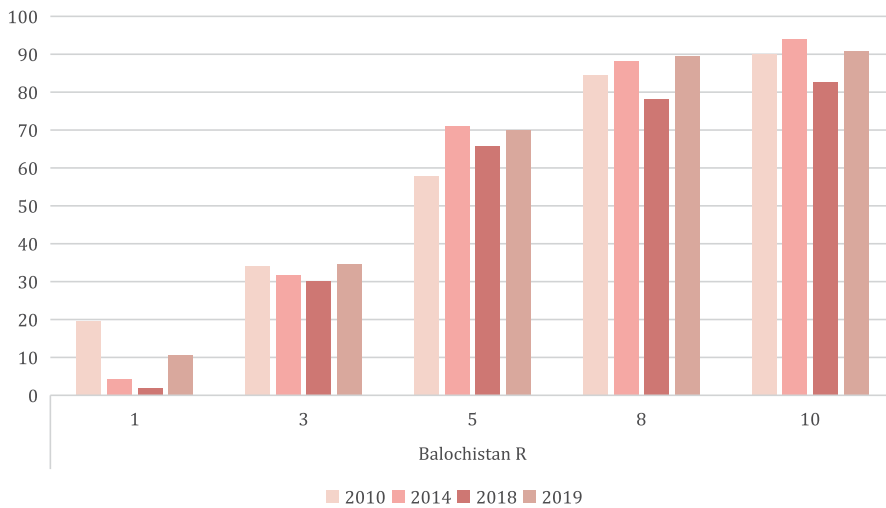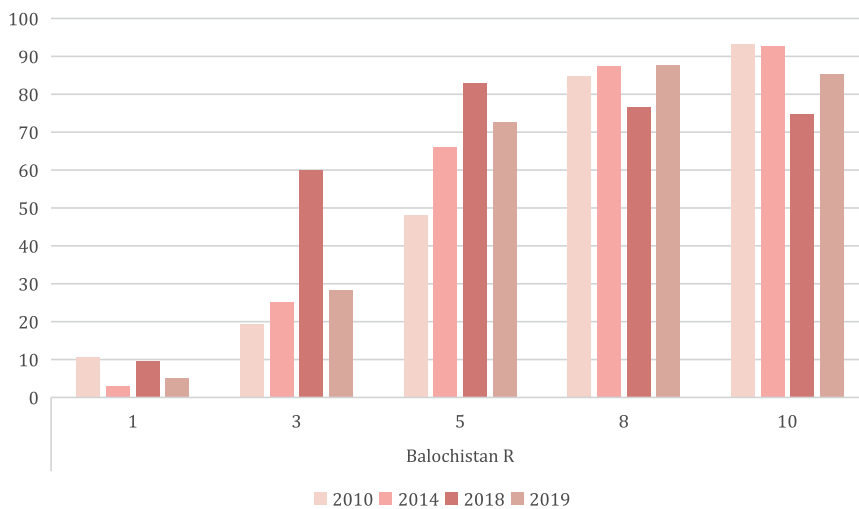over, the progress of national education indicators is even slower, making Balochistan a slightly better performer compared to the rest of Pakistan. Low base and post-devolution prioritisation of education probably explain the province's marginally-better performance in the post-devolution period. Notwithstanding the marginal gains, Balochistan lags behind the rest of Pakistan on nearly all outcomes of education. There are two major explanations for this slow progress.

Firstly, learning outcomes are not registering any significant improvements because learning is not the objective of education policy and practice. The factors in sections 7.1 to 7.4 explain how various elements of the education system are not aligned with the goal of learning.

Secondly, the expansion of schooling appears to have remained a strategic objective of education policy and practice but it has not experienced significant improvement either because serious policy incoherence among various elements of the education system has undermined the latter's capability to ensure timely and reliable provision of all inputs necessary for enrolling and retaining children in school. The management of human, physical, and financial resources available for education is too poor and inefficient to translate into major gains in schooling outcomes. Key proximate factors responsible for the inefficient management of education resources include but are not limited to weak policy and legal framework, ad hoc, centralized, and politically-driven strategic planning processes, outdated and discretionary human resource management systems, unavailability and opacity of data on the performance of key actors, and ineffective accountability mechanisms at different levels in the education delivery chain. These factors are explained in sections 7.5 to 7.11.

A political economy analysis of education, instead, reveals that the various elements of education are neither aligned around the goal of learning nor access. Instead, they are aligned around the goal of patronage politics. Education delivery is driven by short-term, clientelist, political objectives, which are, in turn, shaped by the nature of political settlement. This is explained in Section 8.

Poor Understanding of 'Learning'

Important stakeholders on the demand and supply side of education delivery have a very poor understanding of learning or the quality of education. Politicians often talk about education only in terms of a select number of inputs, such as school infrastructure and number of teachers.[5] Senior bureaucrats also perceive education delivery mostly in terms of the provision of buildings, classrooms, and facilities and ensuring teacher attendance and timely availability of textbooks.[6] School heads and teachers think about quality education in terms of the availability of adequate facilities in school and punctuality and disciplined behaviour of students.[7] Parents, including those who are relatively educated, too have little understanding of learning or quality education. Most parents measure education quality in terms of grades in exams and proficiency in the English language (SED, 2020).

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5 Interview with the Minister of Planning

6 Interview with the Special Secretary of Education.

7 Notes from district consultations conducted for preparation of the Balochistan Education Sector 2020.

Weak Alignment of Education Policy and Practice with the Goal of Learning

Education planning, practice and resource allocation are not directed towards achieving the goal of learning. Improving the classroom environment so that the child can learn is not the focus of the education department.[8] Although official documents and education sector plans mention learning as one of the important objectives of education delivery in Balochistan (SED, 2021; SEDb, 2013), learning-related inputs hardly receive any actual policy attention and resources. In terms of policy recognition, both the Balochistan Education Sector Plans 2013-18 and 2020-25 review and analyse the poor state of learning outcomes and make extensive recommendations about standards, curriculum, textbooks, language, child preparedness, assessment, capacity development, and teacher motivation and availability. However, an implementation review of BESP 2013-18 indicates that there was almost negligible progress on the recommendations on the aforementioned learning-related inputs (SED, 2020).

The reforms introduced in education planning, management, and monitoring were also explained primarily by the fact that the entire process was led, pushed, and financed by donors. The sector plans were also developed with donor support.[9] Donor-led efforts resulted in some gains because both the Chief Minister and Minister for Education between 2013 and 2015 were strong champions of education.

Except for the Chief Minister and the Minister of Education in 2013-15, the political and executive tier of the government appears to have been less enthusiastic about prioritising learning. This is evident, among others, in the education budgetary allocation and spending trends. For instance: the total development expenditures on education amounted to approximately PKR 61 billion between 2011 and 2020 (P&DD, 2011-2020). Nearly 99 per cent of this budget has been spent on the "brick and mortar" component, which includes the provision of missing facilities, the upgrading of existing schools, and the construction of new schools, colleges, universities, and vocational institutes. There has been negligible expenditure from the development budget on the soft side of education delivery such as teacher training, assessment, standard, curriculum, managerial efficiency, and data and research. The limited resources spent on learning-related inputs such as teacher training and data, have often come from donors.

The only learning-related aspects of school education that attract significant attention from politicians and bureaucrats are language policy and history textbooks. In 2014, the Government of Balochistan enacted a legislative act to introduce mother languages as compulsory additional subjects at the primary level. This Act recognised Balochi, Pashto, Brahui, Sindhi, Persian, Punjabi, and Siraiki as the mother languages of Balochistan. However, even this attention was not motivated by a recognition of the importance of language policy in learning design and the needs of children. Instead, the focus on language and history textbooks was, and remains, driven mainly by the historical conflict between the dominant and minority ethnic groups of the country over nation-building objectives and the manipulation of history to promote a particular ideological narrative.[10] This political nature of the focus on language explains why due attention and resources were subsequently not allocated for the effective implementation of the Language Act, resulting in policy incoherence. Key follow-up measures required included ensuring the availability of trained teachers and devising a strategy for teaching mother languages in areas with diverse populations.[11] More significantly, the political act of introduction of mother languages as an additional subject rather than as a medium of instruction has inadvertently increased the burden on children by forcing them to learn a third language in addition to Urdu and English.

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[8] Former Secretary of Education.

[9] Interview with the Special Secretary of SED.

[10] Interview with MPA, Balochistan and Ex-Minister Education

[11] Balochistan Education Sector Analysis 2020, p. 193.

Learning Outcomes are Not Measured and Monitored

Owing to the limited policy recognition and the prioritisation of learning in actual education practice, learning outcomes do not get measured, monitored, and reported in official data on education outcomes. Even the recently introduced Education Management Information System (EMIS) and Real Time School Monitoring (RTSM) systems do not measure and track progress on learning outcomes. Furthermore, the traditional organisation and structure of the secondary education department do not clearly and specifically assign the responsibility for improving and monitoring overall learning outcomes to any particular section or office. Consequently, policy makers often remain unaware of the gravity of the learning crisis and end up equating weak learning with the inadequacy of resources.

The cumulative outcome is that learning remains missing from the agenda of politicians, bureaucrats as well as parents. The lack of reliable data on learning outcomes means that citizens, civil society organisations, media, and governments can ignore the poor quality of education. Even the most active and well-meaning journalists monitor progress in education mostly in terms of the number of schools, missing facilities, and teacher attendance and availability. This is one reason why parents are not demanding better education quality from schools and governments.

Weak Regulatory Framework for Private Schools

The framework for regulating private schools is weak and underdeveloped. The existing framework seeks to ensure the availability of required facilities and a minimum standard of quality in non-state schools and protect parents from exploitation and unfair fee hikes. However, there are two key issues. First, there is a lack of well-defined performance standards against which compliance can be monitored and ensured. Secondly, the existing regulatory framework focuses too much on monitoring and penalising non-governmental actors rather than treating them as partners in the delivery of education (SED, 2020). It lacks potential support mechanisms for non-state schools.

Fragmented and Incomplete Legal and Policy Framework

Twelve years since the 18th Constitutional Amendment was adopted, the Government of Balochistan still lacks an approved education policy. The current education policy framework comprises a mix of executive decisions, sector plans, acts, and departmental notices. In the absence of a holistic education policy, five-year sector plans have only partially filled the gap.

The legal framework governing the delivery of education also has serious gaps. Firstly, the Compulsory Education Act 2014 is too idealistic in scope and fails to consider the resource constraints of SED. Secondly, the curriculum and standards were devolved to provinces but there is still no provincial legislation to govern them. The Single National Curriculum was adopted by the provincial government without any proper due diligence and despite strong objections from the Bureau of Curriculum.[12] Thirdly, in many cases, provincial legislation has been adopted but rules have not been framed. For instance, the rules of the Compulsory Education Act 2014 and other legislative acts of the Balochistan Assessment and Examination Commission (BAEC), Mother Languages as Compulsory Additional Subjects, and the Compulsory Education Act have not been approved yet.[13] This has not only created confusion regarding roles and responsibilities but also slowed down progress on their implementation.

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[12] Interview with the Head of the Bureau of Curriculum

[13] Interview with the Ex-secretary SED

Lack of Need-Based Systemic Planning

The provision of education is not driven by meaningful perspective, medium- and short-term planning. Although the development of sector plans has partially improved strategic planning, poor implementation has diminished its effectiveness. Joint Education Sector Reviews prepared by the SED reveal that only 25 per cent of the targets of the BESP 2013-18 were achieved (SED,2020). Similarly, the BESP 2020-25 was approved by the provincial Cabinet in December 2020. It took the government another year to launch the BESP 2020-25 in December 2021. By February 2022, the effective implementation of the BESP 2020-25 had not begun.

Currently, the provision of necessary inputs for schooling, such as physical infrastructure, books, qualified teachers, and teaching and learning materials, is not driven by data-driven strategic planning, resulting in delays and misalignment between service provision and the actual needs of the education system.[14]

Estimates of the Need for School Infrastructure and Teachers

To obtain a comparative estimate of the physical infrastructure needs of schools in Balochistan, three indicators are reviewed, namely, children-school ratio, pupil-school ratio, and pupil-classroom ratio.

- The children-school ratio (CSR) estimates the availability of schools for children of eligible age at a specific level of education. It is calculated by dividing the total number of eligible age children for a given level of education by the total number of schools for that level of education. Balochistan has lower CSR than Pakistan for all levels of education, indicating better availability of schools. For example, at the primary level, a school is available for every 185 children of primary age in Balochistan compared to 253 children in Pakistan (Figure 15).

- The pupil-school ratio (PSR)[15] indicates the degree of utilisation of existing school capacity. Comparative data indicate that Balochistan has significantly lower PSR values compared to the Pakistani average for all levels of education, implying that existing school capacity is significantly under-utilised. For school education as a whole, Balochistan has the lowest PSR compared to other provinces and regions of Pakistan (Figure 16).

- The pupil-classroom ratio (PCR) measures the availability of classrooms for enrolled students. A low PCR means that the class size is small and that enough classrooms are available. Comparative data indicate that class sizes in Balochistan are smaller than those in Pakistan at all levels of school education (AEPAM, 2021).

- Non-functional schools. Data from SED reveals that there are approximately 2,900 non-functional schools, including 2,853 primary schools, in the province (S&GAD, 2022).

Balochistan's better school availability ratios and under-utilisation of existing capacity are explained primarily by the province's low population density. The province's highly dispersed population means that a greater number of schools have to be built and a higher number of teachers have to be hired to ensure schooling access to all population settlements. This has significantly enhanced the per-pupil cost of the provision of education in the province. Vast distances from schools is a particularly major issue after the primary level[16] as the province has a drastically fewer number of middle and high schools.

[14] Interview with the school headmaster in Killa Abdullah

[15] The PSR is calculated by dividing the number of enrolled students at a specific level of education by the total number of schools at that level of education.

[16] Interviews with a community representative and with the heads of middle and high schools.

The following two indicators provide a comparative overview of the state of teacher availability.

- The pupil-teacher ratio (PTR) helps measure teacher workload and the amount of time and attention a child is likely to receive from teachers. A low PTR shows that a teacher, on average, has to deal with a small number of pupils and, hence, can dedicate more time and attention to each student. Comparative data indicate that Balochistan has greater PTR at the primary level but much lower PTR than Pakistan at the middle and high school levels. There is a teacher for every 50 enrolled students at the primary level compared to 33 students in Pakistan (Graph 17). This indicates a relative shortage of teachers at the primary level but more than optimal availability of teachers at the middle and high school levels.

- The teacher-school ratio (TSR) helps measure teacher availability in schools. A high TSR indicates greater availability of teachers. Balochistan has one teacher available, on average, for each primary school compared to three teachers at the Pakistan level (Figure 18).[17] This explains why over 40 per cent of the total primary schools in the province are single-teacher schools (SEDb, 2021). At the middle and high school levels, the number of teachers per school in Balochistan and Pakistan is largely similar.

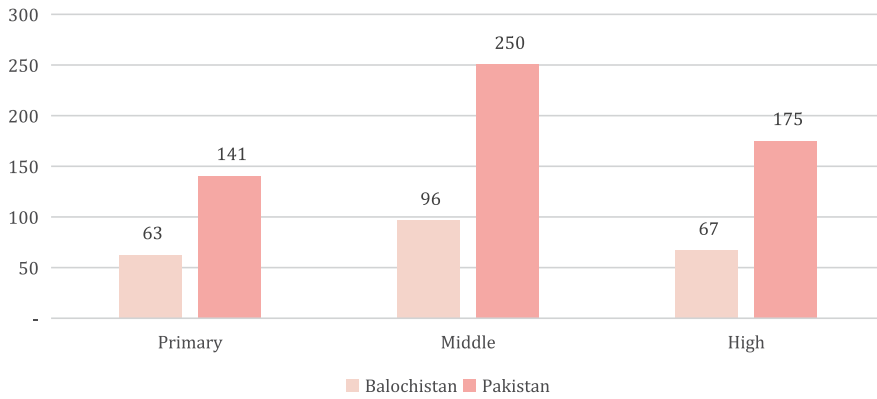*Figure 15. Children-School Ratio*
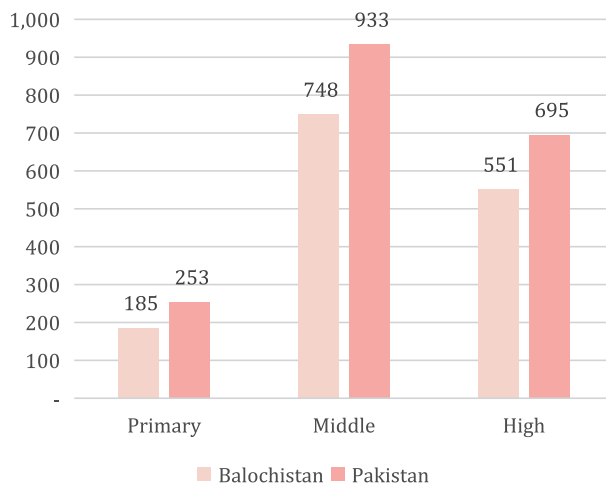
Source: Author's calculations based on EMIS and NEMIS data

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[17] While teacher shortage is a genuine issue, the number of school teachers indicated by NEMIS and EMIS data is fewer than the actual number.
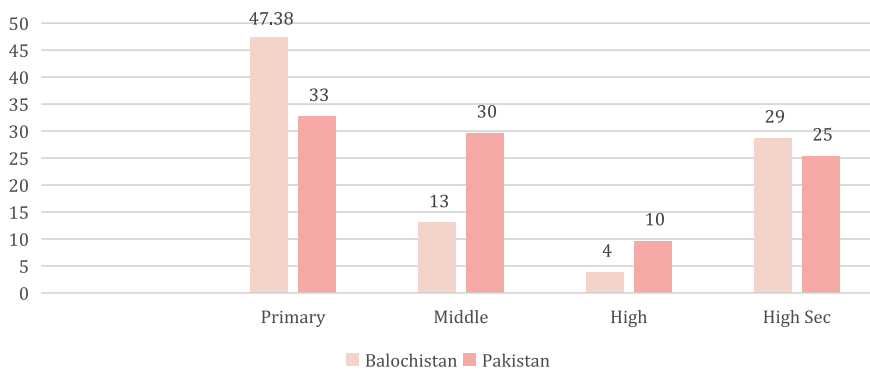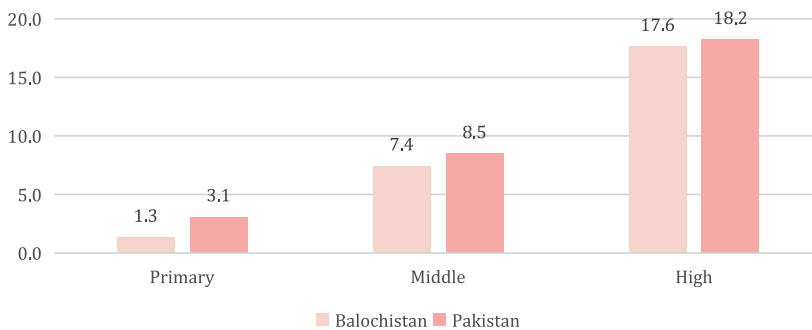
Figure 16. Pupil-School Ratio

Figure 17. Pupil-School Ratio

Figure 18. Pupil-School Ratio

The crux of the aforementioned data is that Balochistan fares relatively better in terms of the availability of schools. Furthermore, data also reveals that existing school capacity in the province is significantly underutilised and that class size is above optimal at nearly all levels of education. Moreover, data also reveals that there is a relative shortage of teachers at the primary level in Balochistan. Lastly, data also reveals that nearly one in every five schools is non-functional.

Findings of empirical data are also endorsed by community representatives and officials of the provincial education department. One of the most consistent findings of consultations conducted with community representatives, school heads, and government officials is that new school buildings, especially at the primary level, are not needed in most parts of the province. An overwhelming majority of key informants consulted for this study and during the preparation of the last sector plan stressed that the government should prioritise ensuring the availability of teachers, upgrading existing primary and middle schools, the provision of water and electricity to existing schools, the provision of transportation and mobility support to address issues of vast distances, running well-designed enrolment campaigns, and the provision of incentives to address demand-side issues related to poverty and cultural barriers (SED, 2020).[18] Participants also emphasised that the non-availability of teachers, JV teachers at the primary level and science and maths teachers at the middle and high school level, is one of the biggest drivers of poor learning outcomes, low enrollments in public schools, and the existence of a large number of non-functional and semi-functional schools.[19] Participants also highlighted the need for the provision of basic utilities such as water and electricity.[20] This is also confirmed by empirical data. Only 12 per cent and 15 per cent of primary schools in Balochistan have access to drinking water and electricity respectively compared to 68 per cent and 61 per cent in Pakistan (AEPAM, 2021).

Both empirical and qualitative data indicate that the traditional approach of horizontal expansion of schools is not an economically viable option in Balochistan given the province's unique demography and terrain. Balochistan will have to shift to a more innovative approach to meet the schooling needs of the population. This may include the use of digital technology tools as well as the provision of transportation support to students and teachers.

Actual Response of the Education System to School Needs

Despite the evidence against the construction of new schools and in favour of consolidation, operationalisation, and efficient utilisation of existing schools, the development budget of education continues to be spent mainly on the building of new schools. A major chunk of development expenditures has also been targeted to ensure the provision of missing facilities but this too has a strong bias towards hard infrastructure. For example, while the number of schools with toilet facilities has increased from 2,886 in 2014 to 5,867 in 2019 (SED, 2014; SED, 2020), most of these newly-built toilets remain without water and sewerage systems (SED, 2020).[21] Between FY 2011-12 and FY 2019-20, the GoB spent approximately PKR 61 billion from the development component of the budget on the expansion of educational opportunities in the province. This expenditure has translated into the following physical outputs:

- 3,100 new schools

- The provision of buildings to nearly 3,500 shelter-less schools

- The construction of toilet facilities in 2,900 schools

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[18] Interviews with the head of a middle school, the head of a high school, and a community representative.

[19] Interview with the head of a high school.

[20] Interviews with the head of a middle school, the head of a high school, and a community representative.

[21] Interview with the head of the middle school in Killa Abdullah.

- The construction of additional classrooms, boundary walls, water facilities, and other missing facilities in public schools

- Two new cadet colleges and 2 BRCs.

- The construction of new degree colleges

- The Establishment of 2 medical colleges

- The establishment of sub-campuses of existing universities

The alarming part about the singular focus on 'brick and mortar' is that even these expenditures are not targeted to those schools that need the resources most. Schools are often built in areas where there is the least need for them.[22] Similarly, the decision to upgrade a school is also not informed by any data, actual need, or consultation with relevant stakeholders.[23] Most often, deserving schools are left out.[24] Similarly, a great chunk of the capital spent on education is consumed by elite public schools in the shape of the chain of Balochistan Residential Colleges (BRCs) and Cadet Colleges. While most of these boarding schools are delivering better quality education, their impact in terms of numbers is very limited. The average total enrolment in these boarding schools is around 300-400 students in a given year but the per-capita cost of building and maintaining these schools is significantly higher as compared to regular public schools.

In addition to public investment planning, the case of hiring teachers is another glaring example of the poor responsiveness of education planning to the actual needs of the system. Despite the serious lack of availability of teachers, the education system appears to have remained oblivious to the problem. Nearly 8,000 teaching posts lie vacant (S&GAD, 2022). The last major recruitment of teachers took place in 2014-15 when 5,000 teachers were hired through a merit-based recruitment system (Alif Ailaan, 2018). Since then, new teachers have not been hired. During the same period, at least 3,000 new schools have been built and hundreds of teachers have retired.

Why Is Education Planning Poorly Aligned with the Needs of the System?

The key reason for the weak alignment of education planning with the most pressing needs of the sector is discretionary, fragmented, centralised, and politically-driven strategic planning. The processes of formation of the Public Sector Development Programme (PSDP) are driven mainly by political considerations.[25] The development budget for education is prepared as per the wishes of ministers and members of the provincial assembly. The SED has a limited say in formulating the development budget for education, let alone involving the attached units and divisional and district tiers. For example, in 2018-19, around 395 development schemes were sanctioned in the development budget, out of which only 16 schemes were reportedly included on the recommendation of the department, whereas the remaining 380 schemes were identified by MPAs (World Bank, 2018). Within treasury benches, the more powerful ministers get to divert more funds to their constituencies. More recently, development schemes are also identified and proposed by the military and non-elected people known as 'notables'. The schemes identified by MPAs, the military, and notables often do not go through any meaningful scrutiny and appraisal process.

In addition to politically-driven planning, the piecemeal approach to the construction and operationalisation of new schools and the upgrading of existing schools is also a major reason for the growing ineffectiveness of

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[22] Interviews with a former Additional Secretary of Education, the head of a high school in Killa Abdullah, and a community representative.

[23] Interviews with the head of a school and a community representative

[24] Interview with the head of a middle school in Kill Abdullah.

[25] Interviews with the Chief of Section Education, P&DD, and the head of a middle school in Killa Abdullah.

development expenditures. The process of construction of new schools is not integrated with the process of hiring human resources required for making newly-built schools functional.[26] The result is that the process of approval of posts for new schools (Schedule of New Expenditures) and hiring against the approved posts commences often after the completion of construction work. The processes of both approval and hiring are complicated and often face long delays.[27] Resultantly, most new school buildings either remain idle or under-utilised. More recently, the existence of a relatively meritorious and rules-based policy for hiring teachers, which reduces room for discretion and manoeuvring, explains why there is a lesser high-level push for the recruitment of new teachers.[28]

The highly politicised education planning explains why many new and old school buildings remain non-functional or without required teachers for years. According to EMIS data, the number of non-functional schools has increased progressively over the past years, rising from 955 schools in 2014 to 2,902 in 2019. Most of these non-functional schools were built recently but remain non-functional due to the non-availability of teachers.[29] These statistics indicate that increased public investments in the expansion of schooling are failing to achieve desired results.

Lack of a Rules-Based Workforce Management Framework and Specialised Institutional Mechanisms and Capacity

SED lacks a rules-based and data-driven framework and specialised institutional arrangement for managing the large work force and assets of school education. In the absence of a rules-based framework, the routine management of human resources takes place through notifications issued on an emerging need basis. The department lacks a well-thought-out transfer-posting policy. Consequently, decisions about human resource management involve significant human discretion,[30] which has enhanced the education system's vulnerability to individual influences and external pressures.

Secondly, nearly 74,173 employees, who are spread across nearly every village and union council of the province, are managed through an outdated and inefficient manual system. Even routine tasks involve coordination between multiple parts of the system, which causes avoidable delays, raises transaction costs, and makes it difficult to monitor performance. The EMIS has attempted to gather and compile data on teachers but this data remains incomplete. The absence of an automated human resource management information system has resulted in serious inefficiencies.

Thirdly, the secondary education department lacks a dedicated unit to look after the management and development of the workforce, resulting in policy discontinuity and fragmentation, and discretionary management practices. Similarly, the education system also does not produce education specialists in areas of teacher training, textbooks, curriculum, and examinations.

Lastly, the personnel managing the delivery of education also lack specialised management skills. Two types of personnel run the education system, i.e., generalist managers belonging to the federal and provincial civil services cadres and education managers, mostly from the teaching cadre. Generalist managers look after the overall management of education in the secretariat, whereas personnel from the provincial education cadres (teaching and bureau) typically occupy senior management positions at the district and divisional levels and in the attached departments of the SED. Generalist managers often do not have any background in education but they have broad

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[26] Interview with Special Secretary of SED.

[27] Interview with Special Secretary of SED.

[28] Interview with Ex-Secretary Education.

[29] Interview with Special Secretary.

[30] Interviews with Special Secretary SED and the heads of middle and high schools.

management skills. Managers from education cadres receive no formal training in management either during their pre-service education or after induction as managers (SED, 2021). A key manifestation of the adverse impact of specialised managers on education management is the case of District Education Officers (DEOs), who come from the teaching cadre. Having remained a part of the teaching fraternity for 15-20 years, a teacher is often unable to nudge and monitor the performance of former colleagues after becoming the DEO. This is also a potential case of conflict of interest. The result is that DEOs are highly vulnerable to the influence and pressure of teacher unions and have understandably failed to curb teacher absenteeism and other issues at the district level.

In the absence of an institutionalised rules-based management framework, most decisions about appointments, deployment, training, postings, and tenures of employees are influenced by external actors, including politicians, bureaucracy, teacher unions, and tribal leaders.[31] The high degree of politicisation and vulnerability to external pressures has compromised the independence and impartiality of the education workforce and adversely affected the provision of education to children. Key manifestations of politicised and discretionary human resource management are:

- Frequent and abrupt transfer/postings of heads of key departments and organisations involved in the delivery of education at the provincial, divisional and district levels have almost become a norm in Balochistan. For example, 13 officers have served as the Secretary SED between April 2013 and Dec 2021, with the average tenure of a secretary being eight months. Relative stability was observed during the two–and–a–half year tenure of Dr Malik when the secretary was changed only twice (Table 1). Similarly, the heads of attached departments are changed frequently and without any compelling justification. Furthermore, District Education Officers (DEOs) and teachers also face frequent, abrupt, and often politically-motivated, transfers/postings.[32] School heads and district education managers have no say in the decision related to transfers/posting of teachers. Consequently, schools in many rural and remote areas remain without teachers as the politically-connected teachers manage to secure transfers to urban centres.

- Similarly, quite often, the existing vacancies are filled through ad hoc appointments or by assigning additional responsibilities to existing officers.[33] Recently, the Cabinet has approved the hiring of intern teachers as a temporary arrangement to make non-functional schools operational (S&GAD, 2022). These ad hoc practices have proven counter-productive for organisational capacity.

Table 1. Tenures of SED Secretaries

S.No	From	To	Duration (Months)
1	22/04/2013	12/05/2013	0.70
2	19/06/2013	24/10/2014	16.17
3	24/10/2014	25/06/2016	18.00
4	27/06/2016	09/01/2017	6.40
5	24/01/2017	12/06/2017	4.63

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[31] Interview with the principal of a high school in Killa Abdullah.

[32] Interview with the head of a high school in Killa Abdullah.

[33] Ibid.

6	04/07/2017	20/07/2017	0.53
7	21/07/2017	19/01/2018	6.00
8	19/01/2018	25/10/2018	9.20
9	25/10/2018	11/02/2020	15.57
10	12/02/2020	17/08/2020	6.17
11	17/08/2020	05/08/2021	11.63
12	17/08/2021	06/10/2021	1.67
13	06/10/2021	To date	6.00

Weak School Management

The major governance and management issues that have affected education delivery at provincial and district levels also exist at the school level. The schools do not have management plans. Schools are run mostly as per the wishes of the head teacher and are vulnerable to external influences.

Input-centric Monitoring Mechanism

The introduction of the Real Time School Monitoring (RTSM) and EMIS have partially addressed data gaps and improved the monitoring capability of education managers. Between May 2016 and May 2019, deductions worth PKR 188 million were made from the salaries of absent teachers identified through RTSM data.[34] Many chronically-absent teachers reportedly submitted pre-mature resignations.

Despite improvements in data regime, serious flaws persist in education monitoring. First, there is a lack of holistic system-wide monitoring and evaluation mechanism for the education system and its various sub-systems. The current monitoring is input-focused mainly, the processes are monitored only occasionally, while outputs, learning outcomes, and impact are not measured at all. Even the input-monitoring is restricted to only a few inputs of education, such as the number of schools, missing facilities, and teacher attendance. Furthermore, while data gathering has improved, the capacity of the PMC to analyse data remains significantly weak.

Secondly, there is limited follow-up action on whatever data is available. The PMC is not yet fully integrated with the SED. Action on the issues identified by RTSM is taken only when there is external pressure.

Failure of Accountability Mechanisms

The education system in Balochistan lacks effective oversight and accountability mechanisms, both at systemic and individual levels. Systemic accountability mechanisms are based on strong monitoring and evaluation systems, fed by robust information systems and oversight mechanisms that ensure remedial action. Systemic accountability is nearly absent at all levels. At the highest level, there is no mechanism to review and monitor the

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[34] RTSM data sheet shared by the Secondary Education Department.

performance of ministers periodically. Similarly, ministers of secondary education have limited will and capacity to monitor the performance of the bureaucratic tier. The Secretary SED also lacks a data-driven results-based system to measure and assess the performance of attached units. This has resulted in a school system where the performance of key stakeholders is neither measured nor reported. The only component of school education that attracts significant high-level attention, and for which a relatively effective top-to-bottom accountability mechanism is in place, is the approval, implementation, and execution of development projects of school education.

In the absence of system-wide accountability, limited individual-level accountability mechanisms exist but they too are focused heavily on teachers. The two main instruments of individual-level accountability are the RTMS data and the Annual Performance Evaluation Reports. Both have serious deficiencies and enable limited accountability at best. The RTSM mainly monitors teacher attendance. The teacher-attendance-centric monitoring regime often ends up penalising the already overburdened primary school teachers, most of whom manage all 6 grades of a primary school.[35] Moreover, it also is based on the inaccurate assumption that teacher absenteeism is the biggest problem in school education. Beyond monitoring attendance, there is no mechanism to measure the performance of teachers, school heads, education managers, staff of attached organisations, and policymakers. The following quote from a middle school headmaster aptly captures the state of accountability:

> *"I was inducted into this school as a teacher in 2002. Since then, I have been asked questions about attendance and the school environment only on two occasions, i.e., in 2014 and 2021. Other than these two occasions, nobody in the education department has inquired about my performance or achievements at the school. Only when somebody would ask me questions about my performance, I will have some incentive to demonstrate performance. When nobody is holding me accountable, what incentive do I have to perform?"*

Annual evaluations are conducted through Annual Confidential Reports (ACRs) for those above grade 15 and through service books in the case of gazetted officers in grades 16 and above. The system has more or less become ineffective. Adverse ACRs are rarely if ever, written. Most supervisors are not even trained in personnel evaluation.

In addition to limited individual-level accountability mechanisms, several social accountability forums were also created as part of the implementation of BESP 2013-18. These forums included the Local Education Group (LEG), the District Education Group (DEG), the Local Education Council (LEC), and the Parent Teacher School Management Committee (PTSMC) at the provincial, district, cluster, and school levels. The creation of these platforms has improved community participation in school affairs to some extent but most remain non-functional as there is limited community interest as well as a lack of sustained support on the part of the government.[36]

The proximate causes of limited systemic and individual-level accountability mechanisms include lack of clarity over the responsibilities of each actor in education delivery, lack of results-based operational planning, limited availability of information on the performance of key actors, absence of high-level accountability forum, administrative discontinuity, and the declining importance of annual performance reviews (SED, 2021).

However, a deeper analysis reveals that unhealthy politics and the tribal mode of social organisation are among the biggest hurdles to accountability. For details, see Section 8.

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[35] Interview with a representative of Teachers' Union.

[36] Interview with heads of Schools.

Limited Public Access to Information on Various Aspects of Education Delivery

Transparency can be instrumental in improving public access to information about the various aspects of education delivery. Increasing transparency is likely to amplify the public voice and enable them to function as an effective check on elected representatives. Currently, there is opacity of information about many aspects of service delivery. Organised citizen groups do not have adequate access to information on the performance of the education minister and the Secondary Education Department (SED).

8. UNDERSTANDING THE POLITICS OF EDUCATION DELIVERY

Lack of sustained political support is a major hurdle in the governance and management of education. Excessive political interference in education has manifested itself across the value chain of education delivery. From politically-driven planning to abrupt and premature transfers and non-merit-based appointments, intrusive political interference has negatively affected education management.

This section deploys the analytical framework of political settlement advanced by Mushtaq Khan to interpret the findings of the previous sections (Khan, 2018). The political settlement framework can offer meaningful insights into understanding the interplay of formal and informal institutions and the de-jure and de facto sources of power involved in education service delivery in Balochistan. The framework can help unearth the potential incentives of different stakeholders in a suboptimal equilibrium of the system. Political settlement plays a critical role in shaping the capacity and commitment of elites to education delivery (Hickey & Hossain, 2019). It also shapes and influences the feasibility of a particular reform in the short to medium term.

Nature of Political Settlement in Balochistan

Several typologies have been prepared for political settlements. Each type of political settlement offers different incentives, opportunities, and constraints for public service delivery. How formal and informal power is organised in Balochistan fits more closely with a fragile and predatory settlement characterised by a high degree of political exclusion, fragmentation, competitive clientelism, and personalised institutions. Key features of an existing political settlement are as follows.

High Degree of Fragility and Exclusivity: The current political settlement is marked by weak legitimacy and a high degree of forced exclusion. There are two layers of exclusion. First, the pro-independence Baloch separatists contest the legitimacy of the state itself and are employing violence to change the political settlement. Secondly, the more popular Baloch and Pashtun nationalist parties accept the legitimacy of the state but have been excluded from political settlement because of their relative reluctance to conform to the informal rules of the game set by the most powerful player in the ruling coalition, i.e., the military (Riaz-ul-Haq, 2021). The ruling coalition relies on repression and distribution of political power and development funds to stay in power.

The current political settlement, however, is highly unsustainable for two reasons. Firstly, the cost of keeping the loosely-bound ruling coalition intact is immense in what is a frail formal economy. Given that the most powerful actor in the ruling coalition lacks meaningful legitimacy and social support base and stands to lose the most from the credible process of elections, there is a constant need to engineer formal political processes.[37] Moreover, since the loyalty of artificial leaders propped up by the military cannot be trusted once the former builds a sufficient independent support base, the military faces the need to constantly produce new, pliant leadership. This helps in keeping the coalition intact through the credible threat of replacement of old-but-now-assertive protégés with new ones. Secondly, the excluded groups enjoy greater and firmer popular support, especially among the chattering class. The social networks supporting the excluded groups include an overwhelming majority of youth

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[37] Sardar Akhtar Mengal interview on Aaj TV, 19 April.

and the educated middle class including professional groups and the bureaucracy.

Political Fragmentation and Low Elite Cohesion: The second defining feature of the existing political settlement in Balochistan is the obdurately high level of political fragmentation and low level of elite cohesion. The key sources of fragmentation are the prevalence of tribal mode of social organisation, regionally-segregated ethnic diversity, and the insignificant political weight of the province in Pakistan's majoritarian federal scheme.

Balochistan has a very comprehensive tribal system characterised by a clear leadership structure and lineage patterns, strong bonds of affiliation, and well-defined dispute-resolution mechanisms (Gazdar, 2007). Tribal social organisation is prevalent in most areas of Balochistan, with possible exceptions being the Mekran division and urban centres, such as Quetta. Tribal networks often act as the default units of political mobilisation and management of collective action. The ubiquity of tribal social organisation has had a profound impact on politics and service delivery. Firstly, as a vertically-aligned social network, tribal social organisation has discouraged inclusive and horizontal class-based political mobilisation and encouraged the targeted provision of public goods through patron-client networks (Gazdar, 2007). Secondly, tribal norms of in-group solidarity, reciprocity, and credible threat of social sanctions often shape individual behaviour in ways that may foster disregard for and poor compliance with formal rules and processes (Lambsdorff, Taube, & Schramm, 2005). This has serious implications for management and accountability processes associated with the provision of public goods such as education. At the local level, in particular, tribalism has weakened formal mechanisms of accountability (Gazdar, 2007).

Ethnic diversity in Balochistan has reinforced and magnified the impact of tribalism on development outcomes. While ethnic diversity has favoured ethnically-aligned political behaviour, the fact that the two major ethnic groups are also segregated regionally has incentivised political competition, bargaining, and accommodation along ethno-regional lines. Secondly, ethnic diversity has made difficult the business of arriving at a consensus on major development priorities or public sector reforms (Gazdar, 2007). Thirdly, it has facilitated the 'ethnicisation' of major decisions about the allocation of public resources, goods and services, jobs, and the creation of new administrative units.

In addition to tribalism and ethnic diversity, majoritarian federal design has also contributed to political fragmentation in the province (Zahoor & Rumi, 2020). To begin with, it has made the province the least attractive constituency for country-wide political parties aspiring to come into power at the federal level, thus incentivising the growth of smaller regional parties. The tribal and ethnic fragmentation combined with majoritarian federal design has incentivised the growth and proliferation of small ethnic and regional parties whose appeal rarely transcends ethnic boundaries.

The low level of elite cohesion has been exacerbated by the progressively rising inter-elite competition for access to power, who face strong incentives to use institutions to distribute public goods among their patronage networks. The interaction of formal electoral processes with informal institutions of tribal social organisation has strengthened and deepened patron-client networks over the years. Fiscal and administrative decentralisation has further intensified political competition among local elites over scarce public goods.

The cumulative outcome is that the prospects of a single party gaining the majority in the provincial assembly have effectively diminished and multi-party coalitions have become a structural feature of polity. Since its creation as a province in 1970, no party has ever obtained an absolute majority in the provincial assembly (Sujag 2020). Moreover, the number of coalition partners has also progressively increased over the past decades. Coalition politics makes agreement on a major policy shift or reform highly difficult. The head of each faction and party in a coalition typically acts as a veto player on key policy decisions and reforms. Similarly, virtually all treasury benchers need to be rewarded through a share in the PSDP and influence over transfer postings to keep supporting the government.[38] There is no political party that takes ownership of the province as a whole.

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[38] Interview with the Minister of P&D.

Politicians are focused almost entirely on their immediate electoral constituencies. Coalition politics has also impeded and diluted accountability as responsibility for the performance of public sector institutions cannot be fixed or attributed to a particular party.

Personalised Institutions: The third defining feature of the political settlement in Balochistan is the highly personalised nature of institutions. Political parties are controlled by individuals and dynasties, who also shape and determine party policy and strategy. Democratic mechanisms for decision-making exist nominally but have not been institutionalised. Similarly, the provincial bureaucracy is highly politicised and governed according to personalized and informal rules shaped mainly by the tribal and ethnic identity of the actor involved. The introduction of competitive electoral politics at a point in time when state capacity was not developed and provincial bureaucracy was relatively new, helped consolidate patronage politics and facilitated elite capture of public organisations (Hickey & Hossain, 2020).

Outsized Importance of Development Funds in Patronage Politics: The fourth important feature of the political settlement in Balochistan is the outsized status of the PSDP. The deeply fragmented nature of polity combined with the negligible presence of the private sector and the limited size of the formal productive economy mean that powerful elites have come to use budgetary resources acquired through fiscal transfers to buy and sustain political loyalties. In this regard, the development budget has acquired great political significance. The military uses development funds and the associated rent-seeking opportunities, such as contracts and other procurement opportunities, to expand its business empire, reward loyal supporters, and cultivate new leaders. Civilian elites use these funds to keep the otherwise loose and fragile coalitions together. The bureaucracy uses them for corruption and rent-seeking opportunities. Furthermore, the limited level of capitalist development means that emerging entrepreneurs and businesses also focus on the PSDP to accumulate wealth. They build alliances with politicians to secure construction contracts or divert public investments for their personal gains. The latter explains why a large majority of projects in the PSDP are individual-centric rather than of collective nature. [39] Consequently, the share in the PSDP has become the most important bone of contention in inter-elite bargaining and often ends up in either litigation or break-up of coalitions.[40] This behaviour was on display when opposition parties joined hands with dissidents of the Balochistan Awami Party (BAP) to bring a no-confidence motion against Chief Minister Jam Kamal.[41] The agenda that brought the opposition parties and dissidents of BAP together was the commitment from the new Chief Minister, who also belongs to the BAP, that MPAs of opposition parties will be given a sufficient share in the current and upcoming PSDP.[42]

The high degree of politicisation of PSDP has not only made rent-seeking and clientelist distribution of public resources a systemic feature of Balochistan's political economy but also adversely affected service delivery. Nearly the entire high-level policy attention, time and efforts are consumed by PSDP at the expense of the soft side of service delivery. Progress on PSDP projects is the top priority of nearly all Cabinet, Ministerial and other senior-level progress review meetings held periodically. [43]

Implications of Political Settlement for School Education

Short-Term Elite Horizons and Constituency-Centric Priorities: The most important policy consequence of the highly fragile, fragmented, and exclusive political settlement is the short-term horizons of political elites. They are unable to make credible commitments and instead, follow predatory behaviour to divert as many public goods to their patronage networks as possible. They have no incentive to invest in systemic education reforms as they are uncertain of their ability to secure gains from these long-term investments. Furthermore, since no political party

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[39] Only projects benefiting masses should be in PSDP: Balochistan High Court - Pakistan - DAWN.COM

[40] Balochistan opposition holds protest over new PSDP - Pakistan - DAWN.COM

[41] Behind the scenes: Why did CM Jam Kamal Khan resign? (geo.tv)

[42] Interview with the Minister of P&D.

[43] Interview with Special Secretary of SED.

has a support base that transcends ethnic boundaries, there is no ownership of the province as a whole, which has discouraged the introduction of province-wide programmatic interventions in education and encouraged constituency-specific targeted provision.

Domination of Public Agenda-Setting and Accountability Discourse by Issues of Conflict and Legitimacy: One of the most important impacts of the ongoing ethnic conflict on service delivery is that the public discourse and agenda-setting space has been hogged/dominated by issues of conflict and legitimacy of the ruling coalition. Service delivery issues remain low in agenda-setting as well as accountability debates. It is difficult for even the relatively popular and ideological parties to ignore the more pressing and visible issues of enforced disappearances and violations of human rights.

The military-led ruling coalition too is interested primarily in preserving order and political control and maintaining a semblance of stability. Their elected allies are also responsive and vocal mainly on the issues that the military prefers. Education delivery remains a secondary priority for the ruling coalition.

Weak Alignment of Elite Interest with the Expansion of Schooling: Balochistan lacks a critical mass of the capitalist class that may exert pressure on the government to invest in education for producing skilled labour. The main incentive for elites to invest in education comes from the need to build, maintain, and extend patron-client networks for electoral gains. This explains why short-term constituency-centric patronage politics shapes education provision.

Education is the biggest civilian employer in the province. Compared to other sectors, education can deliver both popular legitimacy and access to a great many public goods that can be distributed directly to favoured groups and regions. These public goods include schools, jobs, public procurement contracts, and transfers/postings at favoured positions and in favoured regions. The political payoffs of these tangible goods fit well with the short-term time horizons of ruling elites. In contrast, investment in learning-related inputs of education is invisible and cannot possibly produce rapid returns. In given circumstances, there is an almost complete misalignment of elite interests with gains in learning outcomes. There is, however, partial alignment with the expansion of schooling but only insofar as it enables elites to divert public goods to their patronage networks. This explains why there is considerable policy incoherence even for access-related objectives.

Within elites, there is a qualitative difference among types of political parties. The relatively ideological and representative political parties have an interest in the provision of education not only for building and maintaining patron-client networks but also for securing legitimacy among core supporters. This explains why, contrary to the nature of the political settlement, the education system in Balochistan witnessed an unprecedented increase in public financing, merit-based recruitment of teachers, and the introduction of much-needed reforms in management and governance during the two-and-a-half-year tenure of Dr Malik of National Party.[44] Most of these reforms survived the change of government but did not receive the same level of support. In contrast, the relatively non-ideological political parties use education mainly for patronage politics. They have no interest in systemic reforms. Both elites have also prioritised education to get access to international development financing.

High political fragmentation and the fragile nature of political settlement explain the half-baked and incoherent nature of reforms. These "occasional islands of success," however, have resulted at best in "institutional isomorphism and mimicry—institutional mimicking of what is considered "good bureaucratic practice" rather than a real change in ground realities (Aiyar et. al, 2021).

Strong Power of Teacher Unions: Teacher unions are organised and have the ability to block reforms that they perceive as an infringement on their core interests. Political parties across the spectrum tend to surrender to

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[44]   Interviews with the Special Secretary of SED, the Secretary of SED, the Chief of Section at P&DD

pressure exerted by teacher unions. Political parties appease teacher unions because the latter are not only well-organised but also useful during election campaigns and on election day.[45] Teachers play a crucial role in the conduct of elections as they perform a range of election duties. Consequently, there is a close connection between teachers and political elites. Teachers can be influential constituents both as members of campaign teams but also as key influencers in their tribes.

A High Degree of Politicisation of the Education Workforce: The working and management of the education workforce are highly politicised and influenced by informal institutions and negotiations. From the selection of sites for infrastructure projects to appointment and postings at important positions, nearly all major decisions concerning the planning, management, and monitoring of school education are shaped largely by ethno-regional and coalitional politics at the provincial level and tribal politics at the local level.[46] Formal arrangements function as intended only insofar as they are aligned with the interests of the powerful actors.

Weak Community Ownership and Engagement: Consultations with heads of schools and government officials revealed a 'lack of interest' on the part of parents in the affairs of schools.[47] The disinterest of parents is explained by multiple factors. Firstly, the relatively educated and well-off classes have opted out of public schools and, therefore, are not concerned much about the state of affairs there. From school teachers to politicians, nearly every stakeholder interviewed for this research had kids enrolled in private schools. Those who enrol their kids in public schools are often among the poorest segments of society. But even these people have a very pessimistic view of potential returns from enrolling kids in public schools. The pessimistic view of public schools combined with the low literacy level of relatively poor parents discourages them from taking an active interest in school affairs. The result is that there is a lack of an organised and powerful constituency to exert pressure on the education system at the local and provincial levels. Secondly, hierarchical tribal structures and social norms of in-group solidarity also prevent ordinary parents from engaging in school affairs and holding teachers or heads of schools accountable.

With regard to community engagement, two very intriguing observations were made during field research. Firstly, schools, especially middle and high schools, were observed to be functioning better in areas where there was strong ownership by the community as a whole or local leader. In the two cases where the community leader was proactively engaged in school affairs, the leader was not a traditional tribal elder. Instead, an ordinary political worker had risen to leadership position.[48] Secondly, the number of madrassahs in rural areas had increased over the years. Nearly all madrassahs were functional without any formal means of support from the government or a non-profit organisation. The biggest success factor was strong community ownership and support. Most community members viewed madrassahs not only through the lens of religion but also treated them as privately-owned ventures.

The Monopolisation of Public Policy Space by the PSDP: The high-level policy attention, time, and resources that should have been allocated to monitoring and improving school education as a whole have been consumed by development projects. While meetings to monitor progress on PSDP projects are held almost every month at the level of either the Cabinet, Chief Minister, Minister or Chief Secretary, meetings to monitor the soft and mundane aspects of education delivery do not take place for months and even years.

These examples do not prove that providing more textbooks, higher teacher wages, or school improvement plans does not contribute to student learning. Instead, they show that attempts to address these individual problems without considering the wider system are likely to fail.

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[45] Interview with teacher unions.

[46] Interviews with the Special Secretary of SED, the Secretary of the SED, and heads of schools.

[47] Interview with heads of schools.

[48] Interviews with the head of a school and a community representative.

9. POLICY RECOMMENDATIONS

- There is a strong need to make the political settlement more inclusive and stable. This may require political reconciliation with armed militant groups as well as steps to ensure free and fair elections so that genuine representatives of the people are elected.

- The federal design may be altered to either create a greater incentive for the emergence of cross-ethnic political parties or enable ethno-regional parties to get a simple majority in the provincial assembly. The latter can be achieved through the enhancement of the powers of the Senate and the former can be achieved through the division of the province into two provinces. Both are likely to reduce political fragmentation across ethno-regional lines.

- Identify, engage, and recognise political champions of education so that they have the incentive to advocate for education reforms in public as well as agenda-setting debates.

- Identify and harness key political moments that can be leveraged for a greater focus on improving education outcomes.

- Devolve day-to-day administrative affairs of education to lower tiers to promote local accountability and reduce the unnecessary burden at the provincial level.

- Generate political incentives to focus on access and learning outcomes by supporting data-based information campaigns that highlight the issues of out-of-school children and poor education quality.

- Create data-based tools that may enable civil society and other actors on the demand side of education to measure progress on education outcomes and attribute progress or decline to political representatives.

- Promote social awareness by supporting campaigns that highlight the unhealthy role of tribal social norms and sensitise local communities to the need to engage in school affairs.

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ANNEX-I: LIST OF KEY INFORMANT INTERVIEWS

#	Name of Official	Designation	Date
1	Mr. Ghulam Ali Baloch	Ex-Secretary Secondary Education Department	29th October 2021
2	Mr Raheem Mengal	Chief of Section (Schools), P&DD Balochistan	9th November 2021
3	Mr Attaullah	District Education Officer, Killa Saifullah	23rd November 2021
4	Dr Gulab Khan	Deputy Director, Bureau of Curriculum	24th November 2021
5	Mr Akram Wardag	President, SESA	24th November 2021
6	Mr Asghar Khan	Ex-Employee RTSM	2nd December 2021
7	Mr. Attaullah	Head, Government Boys Middle School, Popalzai	2nd December 2021
8	Syed Musa Kaleem	Head, Government Primary School, Marwar Sayedan	2nd December 2021
9	Mr. Izzatullah	Head, Government High School, Mazai Adda	2nd December 2021
10	Malik Yahya	Government High School, Mazai Adda	2nd December 2021
11	Mr Saboor Kakar	Ex-Secretary Secondary Education Department	08 April 2022
12	Mr Shamsullah Khiral	Trainer PITE	13 April 2022
13	Mr Hayat Kakar	Special Secretary, SED	05 April 2022
14	Mr Zahoor Buledi	Minister Planning and Development	11th March 2022

MEASURING ACCESSIBILITY BENEFITS OF PUBLIC TRANSPORT: EVIDENCE FROM THE LAHORE ORANGE LINE METRO TRAIN (OLMT)

Alvina Sabah Idrees and Saima Sarwar

ABSTRACT

Rapid urbanisation and migration towards Lahore are causing inadequacy in public service delivery, most notably in public transport. The Lahore Orange Line Metro Train (OLMT) is the first light rail mass transit project of Pakistan to cater to the need of the growing population of Lahore. The current study is based on the ex-post evaluation by exploring the multiple accessibility benefits, the passengers' willingness to pay and social inclusion. The study also developed a case for accessibility improvement by identifying the gaps that may create hurdles for users or discourage non-users. Another key concern is heavy subsidisation, which is an undue burden on government resources. Some viable policy options are suggested to make this project financially sustainable.

1. INTRODUCTION

Urbanisation and Development of Cities: A Global Perspective

Developing economies are urbanising rapidly which is creating both challenges and opportunities for the masses. Historically, urbanisation has always been strongly correlated with high economic growth through generating employment opportunities and creating more production activities. However, urbanisation cannot be effective without the proper availability of infrastructure, incentives, and well-functioning institutions (Glaeser & Xiong, 2017). In the absence of these factors, societies cannot reap maximum benefits from the urbanisation process. The economic progress in developed economies is occurring by infusing all these elements and the urbanisation process is resulting in the growth of smart cities with more economic opportunities and higher per capita income growth. Since 1951, the percentage of the population living in urban areas has increased manifold from 17.7 per cent to 36.4 per cent in 2017 (UNDP, 2018). However, it is observed in the case of developing countries that the relationship between urbanisation and growth has not been automatic. The absence of sound policies, no productivity and no job growth has resulted in unplanned and unmanaged urbanisation that has given rise to urban slums, environmental degradation, poverty, and inequality (Ellis & Roberts, 2015).

Currently, Pakistan is facing the rapid expansion of cities due to increased population, rural-urban migration, and investment in real estate. This urban sprawl has created many drastic issues like housing deficit, insufficient and inaccessible transport infrastructure and, more importantly, the reduction in the agricultural land due to increased built-up areas. Cities are considered the hub of economic activities but due to the rising growth rate of population, congestion is becoming an acute problem in the cities of Pakistan. This congestion has caused problems mostly on roads because of an increase in the number of cars on the roads, which has ultimately led to mismanagement and chaos in the lives of city commuters. Cities that have seen incredible growth rates are the ones having strong governance architecture. Thus, there is a need to build an empowered city government that has the capacity and authority to generate revenue and manage the delivery of municipal and other services. These are the instrumental factors in the social development of cities. According to a recent estimate by UNDP (2018), cities contribute 80 per cent of the global gross domestic product and in the case of Pakistan, this contribution is about 55 per cent. Interestingly, 95 per cent of the federal tax comes from just 10 big cities in Pakistan. Pakistan's urbanisation rate is 3 per cent per annum, which is the fastest in South Asia.

Urbanisation and Transportation Challenges in Large Agglomerations

With the growing urban settlements, cities in large agglomerations are facing urban transportation issues. Transportation infrastructures are usually very complex due to the involvement of various modes of transport, a multitude of origins and destinations, and congestion on roads during peak hours. Urban transport systems also vary depending upon the urban spatial structure and forms of urbanisation in cities. Cities are considered the locus of economic activities like production, consumption, and distribution. The urban transportation system plays an important role by facilitating the commute of people to reach their destinations, managing commercial activities, and providing facilities for recreational activities. An efficient urban transportation system helps to increase mobility in high-density areas and boosts urban productivity. Moreover, better transport facilities increase the visibility of urban cities both at the regional and global levels. On the other hand, inefficient transportation systems may cause many problems for cities. The foremost and major issue is road congestion, which has plagued many cities, causing problems for freight transportation and resulting in environmental hazards. Congestion is usually characteristic of large agglomerations with a threshold of about 1 million inhabitants. Congestion is particularly related to motorisation and the diffusion of the automobile, which increases the demand for transport infrastructures.

The second most important issue is related to the commuting time between residence and workplace, which is also linked to residential affordability (Masoumi et al., 2021). A long commuting time results in several social

problems, such as isolation i.e., less time spent with family or friends, and poorer health. Similarly, many other challenges – inadequate public transport facilities, difficulties faced under non-motorized immobility, the loss of public space, high infrastructure maintenance costs, environmental impacts, land footprint, energy consumption, road safety and accidents – cause hindrances for an urban transport system in large agglomerations. Developing economies face greater difficulties in meeting the transportation requirements of the masses due to severe constraints on public resources. Nevertheless, policy experts at United Nations and World Bank have suggested various solutions to mitigate the negative impacts of congestion in cities. Some of the solutions include traffic signal synchronisation, ramp metering, car ownership restrictions, carpooling or vehicle sharing, high occupancy vehicle (HOV) lanes, congestion pricing, public transit, and non-motorised transportation.

Urban transit is often perceived as the most efficient transportation mode for urban areas, especially large cities. Public transit is generally considered publicly owned. Moreover, public transit is heavily subsidised with low economic returns. Public transit often provides a public service as it allows accessibility and social equity but has a limited connection with economic activities. However, the most important challenges faced by this urban transit system are decentralisation, connectivity, competition, construction and maintenance costs, fare structures, and legacy costs.

Transport Infrastructure and Urban Sprawl: A Tale of Lahore City

Lahore is a metropolitan city and the second most populated city in Pakistan with a population of 11 million as per the 2017 census. It is observed that highly educated people do not prefer to use public transport due to many concerns including time cost, inefficient infrastructure, and safety issues. Therefore, the city roads are becoming more congested with private cars. According to a recent estimate by the Planning Commission of Pakistan, with an average population growth rate of 2.4 per cent, Pakistani travel approximately 400 billion passenger-kilometres (PKMs) per year, which is expected to rise to 1,000 billion PKMs by 2030 (Government of Pakistan, 2018). This will add pressure on the urban transport infrastructure. The urban population accounts for approximately 37 per cent of the total population, which is expected to reach around 60 per cent by 2025. Therefore, investment in road transport infrastructure and mass transit systems is the need of time. The transport itself contributes 22.3 per cent to the services sector GDP and accounts for approximately 6 per cent of the nation's total employment. However, due to the high population growth rate, cities in Pakistan are facing two major challenges, namely, housing and transport infrastructure. These challenges are more pressing in Lahore as it is the second-largest city in Pakistan. The Government of Punjab is trying to provide solutions to these challenges through the public sector, the private sector, and public-private partnerships. Many public sector transport projects have been undertaken by the government to facilitate its residents by reducing commute time and making public transport accessible for everyone at reasonable rates. The major transportation modes in Lahore include:

1) Rickshaws and taxis (including cab-hailing services such as Uber and Careem).

2) Bus services (the two major providers of such bus services are the Punjab Mass Transit Authority (PMA) and Punjab Transport Company (PTC).

3) Metro trains (the LOLMT service, which is built on the Turkish Model).

4) Motorbikes and private cars.

To improve the transportation network system and use of transport services, a network of feeder buses is also introduced by the Government of Punjab to improve connectivity, which is facilitating the residents in using the new transportation service. Moreover, the Lahore Transport Company (LTC) runs an array of high-occupancy vehicles (HOVs) as well as low-occupancy vehicles (LOVs). The LOVs include wagons and minibuses which move throughout the city. The LTC has provided licenses to individuals for running such kinds of transportation

services making it convenient for the public to access metro bus stations. This connectivity has developed a unified system of transportation within Lahore.

However, the current public transportation system of Lahore is facing many issues such as inappropriate operational timetables, inefficient use of road space, and poor condition of public transport facilities (including bus terminals and buses), which collectively pose severe challenges to urban connectivity. The factors responsible for these issues are escalated travel demand, inadequate capacity, improper governance, and poor urban transport planning. Currently, the Bus Rapid Transit (BRT) system is becoming more popular among people as a mode of public transport as it helps users save time cost of travelling (Batool et al; 2020). It is also estimated that 206 cities worldwide, including 42 Asian cities, cover 5,569 km of routes through BRT systems, which cater to the needs of 34 million passengers every day.

Like other developing economies, investment in roads and highways has also been a major focus of Pakistan's urban policies. Nonetheless, very little attention has been paid to making public transport more attractive and effective in terms of delivery. This is due to inefficient transport policies in terms of affordability and accessibility, which has diverted passengers from HOVs to single occupancy vehicles (private cars and bikes). Resultantly, the use of personal vehicles has more than tripled over a decade triggering the issues of road congestion, fuel shortages, road traffic accidents, and greater environmental pollution (Government of Pakistan, 2016). Private vehicle ownership also creates substantial negative externalities in the form of congestion and pollution (Timilsina and Dulal, 2010).

The Lahore Urban Transport Master Plan and Lahore Orange Line Metro Train (OLMT)

The urban population is growing at an alarming rate and Pakistanis are moving towards cities faster than any other country in South Asia. More than half of Pakistan's projected population is expected to live in cities. An integrated urban development strategy for capacity building and up-gradation of urban management is reflected in Pakistan's Vision 2030 which targets a set of strategic areas for sustainable development. Cities are considered an engine of economic growth and Vision 2030 calls for an improvement in urban service delivery that targets Lahore as well (Government of Pakistan, 2007).

Lahore is the second largest urban city in Pakistan. The urban transport system of Lahore comprises both formal and informal modes of transport but rapid urbanisation and migration to Lahore are creating inadequacy in the delivery of public services and, most notably, in public transport. Over the past few years, there has been a massive increase in motor vehicles in Lahore, estimated to be around 6.2 million, which is 32 per cent of the total vehicles in Punjab.[1] Urban mobility in Lahore is facing serious challenges with every passing year, which has caused the rising demand for private taxi services, such as Albayrak, Uber, Careem, Swvl, Mylift, etc. Nevertheless, the Government of Punjab has taken numerous measures over the past few years to overcome the transport issues in Lahore and the most recent addition to such projects is the Lahore OLMT.

The main objective of the Lahore Urban Transport Policy is to reduce traffic congestion, increase accessibility, modernise the transport system, and build capacity through a well-integrated sustainable transportation system. The Lahore OLMT is a part of the master plan of an integrated rapid mass transit rail (MTR) system, which was first proposed in the 1990s by the Japan International Cooperation Agency (JICA) to resolve transport issues in Lahore. The feasibility report by JICA was later reconsidered and upgraded by World Bank in 2003 and a further analysis was undertaken by the Punjab Government with the help of MVA Asia in 2006. Moreover, in 2008, Asian Development Bank (ADB) proposed the feasibility of this project under its technical assistance loan program but unfortunately, the project did not materialise and the loan lapsed in 2009.

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[1] Capital City Police Lahore website https://lahorepolice.punjab.gov.pk/city-traffic-police

Later, JICA was entrusted with the conduct of the Lahore Urban Transport Master Plan which consisted of both the Bus Rapid Transit (BRT) and urban rail (Rapid Mass Transit System) and the final report was submitted in 2012. The Lahore Rapid Mass Transit project is an attempt to provide sustainable urban mobility based on global practices. The project has identified four main corridors: the Green, Orange, Blue, and Purple Lines, which are to be connected via feeder routes. The detailed plan is provided in Figure 1.

Figure 1: Route Map of Green, Orange, Blue, and Purple Lines under the Laster plan of the Lahore Rapid Mass Transit System

Source: Asian Development Bank.

In the first phase of this project, the Green Line was the priority route, initially proposed as rail-based mass transit but was postponed due to institutional and financial constraints and was later replaced with a BRT, formally known as the Lahore Metrobus System. The project was executed by the Government of Punjab with Turkish assistance and completed in 2013. The second priority route under Phase 1 was the Lahore OLMT, which is the first light-rail mass transit project in Pakistan, to cater to the needs of an increasing number of passengers and overcome the heavy traffic congestion in Lahore. The project is jointly undertaken by China State Railway Group Co. Ltd. and China North Industry Co. Ltd. The second phase of the proposed plan for the Lahore Rapid Mass Transit System comprises the Blue Line and Purple Line, but the feasibility of these routes is still under debate. The OLMT mega project has been controversial since its inception and has had a bumpy ride on the road to its completion.

The Lahore OLMT is a fixed-route mass transit system, and the ex-post evaluation of this project in the current study determines the passenger accessibility benefits and searches for some viable policy options to make this project financially sustainable. The consumer-oriented benefits arere explored through a field survey by collecting passenger data daily during September and October 2022. The demographic and economic profiles of the riders are collected and their likely association with accessibility benefits is examined. Usually, the policy outcomes of an urban transportation system face a trade-off among different aspects of accessibility.

This study undertakes a post-completion performance assessment by exploring the impact of OLMT ridership on consumers' accessibility. The main accessibility aspects taken into consideration are proximity, affordability, mobility, convenience, and connectivity as well as social acceptability. Therefore, the study outcomes also support the subsidisation of OLMT as a rational approach from the perspective of social inclusion. The OLMT project is heavily subsidised and Pakistan is among those eight countries that are at serious risk of its inability to repay the loan under the China Belt and Road Initiative. The estimated cost per passenger of the OLMT is approximately Rs. 130 against the per passenger fare of Rs. 40. On the other hand, there is a continuous decline in passengers' number (60 per cent lower usage as compared to the capacity), which is fuelling the deficit. To encourage its use, the Lahore Mass Transit Authority also suggested reducing the OLMT fare by Rs. 10, but this is not a sustainable solution as it is already running a deficit. Hence, there is a need to achieve financial sustainability for this project by generating additional revenue streams. This can be attained by improving the accessibility that can incentivise OLMT usage along with adopting a systematic approach for generating additional revenue streams.

In light of the current debate, this research report addresses some policy questions:

- Who benefits the most from the Lahore OLMT in terms of demographics and employment profile?

- To what extent the OLMT has improved accessibility of the commuters?

- How to further incentivise the use of the OLMT?

- Does a mass transit system, such as the Lahore OLMT, play a role in increasing social inclusion?

- What are the contributing factors that have influenced the rider's decision in favour of the OLMT against other competing modes of public/private transport?

- What systematic approach can be devised to generate additional revenue streams by introducing targeted demand-side subsidies, i.e., who to subsidise and by how much? This aspect is considered by capturing the willingness to pay of OLMT commuters.

- Is there a connectivity gap among non-users of the OLMT or discourages users (also called ex-regular users)?

- Do transport policy instruments, such as mass transit, play a role in overcoming the gender mobility gaps?

- What aspects of transport accessibility must be prioritised to develop feasibility study plans for similar projects in Lahore or other metropolitan cities of Pakistan?

2. THEORETICAL BACKGROUND

The Role of Transport Policies in Economic Development

There is a need for continuous upgradation and improvement in a nation's transportation policy due to a steadily rising population, rural-urban migration, and increased consumption of vehicles. Other contributory factors leading to the rising demand for public transportation facilities are the growth of cities, changing economic structures, and rising economic activities. The size and structure of urban as well as rural economy is constantly evolving but most notably is the changing travel patterns and demand for urban transport that require strategic planning of urban transport policy.

There are numerous social objectives of a transport policy. One of the most important objectives is to facilitate the growth of agglomeration economies (Graham, 2008; Selod & Soumahoro, 2018). This is achieved by reducing transportation costs, increasing trade, improving connectivity, and the development of networks. Second, to enable social inclusion through improved access to transportation services, reduced costs, and easy access to economic opportunities for the marginalised and the poor (Stanley & Stanley, 2017; Ricci, Parkhurst & Jain, 2016). Third, to attain sustained economic growth by reducing negative externalities on health and the environment (Dora, Phillips & Phillips, 2000). The extent to which these benefits can be reaped from a transport policy depends upon the travel behaviour of the population and community responses at large.

However, there is always underinvestment in public transport systems and a lack of commitment to long-term solutions, particularly in the case of underdeveloped nations. One of the main reasons is the lack of capacity and resources. Low- and middle-income countries face a serious shortage of transport infrastructure. Thus, transport policies have great potential for achieving sustainable and inclusive growth in these countries (Berg, Deichmann, Liu & Selod, 2017). But it also needs to be kept in mind that the impact of a transport intervention is not always certain. It varies with the needs of a society, the society's willingness to cost sharing as well as its economic structure. Some transport investments may not be cost-effective both in terms of financial and social costs. Therefore, transport economists, engineers, and policy analysts need to have a deep understanding of the strategic use of scarce resources to weigh associated costs and benefits for the realisation of sustained economic growth, development, and social inclusion.

Transport Policy Instruments

Transport planners use a wide variety of policy instruments. According to May and Still (2000), transport policy instruments can be divided into five broad categories, i.e., land use, price incentives, infrastructure development, infrastructure management, and information provision. A recent study by Berg, Deichmann, Liu, & Selod, (2017) has simplified the policy interventions by generalising them into three main categories, namely, investment in transport infrastructure, price instruments, and transport regulations. These policy interventions affect both the supply-side and demand-side of transportation. Each category is crucial for achieving the underlying key objectives of a transport policy as attaining one objective may compromise the others and most commonly the classic trade-off between efficiency and equity also cause difficulties for the transportation policy.

Price signals in the form of taxes or subsidies are used to influence consumers' choice of mode of transport and transport behaviour. These may include different forms such as toll taxes, parking fees, congestion taxes, fuel taxes, targeted demand-side subsidies, and subsidies to promote a clean environment. The transport infrastructure includes not only the construction of new capital (such as living streets, roads, walkways, bridges, tunnels, stations, railways, airports, ports etc.) but also the up-gradation of existing structures. The regulation side deals with rules of infrastructure construction, the overall working of the transport sector, driving restrictions, and the environmental impact of transport.

Utilities' Role in Transport Policy

There has been a paradigm shift in evaluating a transportation system (Litman, 2017). Earlier it was very narrow and specific only to traffic-based analysis in terms of traffic efficiency and cost-effectiveness, which later shifted to mobility, i.e., transport efficiency. The first two concepts (traffic-based analysis and mobility-oriented analysis) are nested within the accessibility-based analysis which is a broader concept that evaluates a transportation system in terms of people's ability to reach the desired destinations (Litman, 2011), i.e., decreasing the mobility gap (Leigh, Scott and Cleary, 1999). Passenger accessibility is considered the most important outcome of a public transport intervention, aimed to enhance social inclusion via increased connectivity and communication (Saghapour et al., 2016).

There has been a long debate among researchers regarding the impact evaluation and appraisal of transport policy interventions. However, it is pertinent to note that the methodological considerations and impact may vary with the transport infrastructure (such as roads, bridges, railways, airports, seaports, waterways, terminals, etc.) as well as the mode of public transport (such as buses, trains, light rails, trams, subways, etc.). Thus, there cannot be a comparability of the impact evaluation of different transport policy interventions based on common parameter(s). The impact evaluation is influenced by the definitions of cost and benefits as well as the value judgment of the policy analyst (Nash, Pearce & Stanley, 1975). For example, an operator of public transport such as a rapid mass transit rail (MTR) would be interested only in revenue maximisation, whereas a social scientist or a policy analyst would focus on maximising the utility for users in terms of accessibility (Lichfield, 1992). In the present context of the Lahore OLMT, the evaluation methods for a light rail can be classified into four types: i) financial analysis from the perspective of the service provider/operator, ii) community impact analysis in terms of the societal benefits and costs in aggregates, iii) purely environmental impact assessments, and iv) social cost-benefit analysis from the perspective of passengers/users (Table 1). In light of the main evaluation features, as mentioned above, the current study focuses not only on examining the multiple accessibility benefits and social inclusion but also develops a case for accessibility improvement by identifying the gaps that may create hurdles for users or discourages non-users. Another key concern that the study aims to address is to reduce the subsidisation costs. Therefore, the willingness to pay of the passengers is also explored along with features that may increase the revenue streams.

Table 1: Four Aspects of Impact Evaluation of a Light Rail Mass Transit

Evaluation Aspect	Sector	Outcome
Financial Analysis	Service Provider $	Capital costs, operational costs, revenue earned
Community Impact Analysis	Community	Large-scale spillover aspects such as employment generation, rise in property value, economic growth, and development
Environmental Assessment	Environment	Greenhouse gas emissions, land use, and protection of heritage
Social Cost-Benefit Analysis	Passengers	Accessibility, service quality, user satisfaction, and preferences

Source: Adapted from Lichfield (1992).

Without a good transportation policy, the fulfilment of basic human activities and needs is either delayed or sometimes not available. The congestion on roads and highways increases the opportunity cost in terms of wasted time as well as environmental damage. A well-planned transport system also plays a vital role in urban development through improved networks and multimodal travelling. As shown in Table 1, a transportation policy's evaluation looks at its impact on the community in terms of employment generation, rise in property value, environmental impact, and economic growth. The agency's perspective is the earnings from service provision, while passengers' perceptions include benefits in terms of accessibility and service quality. The environmental assessment focuses mainly on greenhouse gas emissions followed by land use and protection of heritage. However, from a public policy perspective, passenger accessibility is considered the most important outcome of a public transport intervention aimed at enhancing social inclusion via increased connectivity and communication (Saghapour et al., 2016).

Passenger accessibility of a transportation system is evaluated in terms of people's ability to reach their desired destinations (El-Geneidy and Levinson, 2006; Ascher, 2007; Kenyon et al., 2002; Litman, 2011; Bocarejo and Oviedo, 2012; Fransen et al., 2015). Similarly, passengers' ability to reach destinations is evaluated in terms of proximity, affordability, mobility, convenience, connectivity, and social acceptability. The literature further elaborates that accessibility-based analysis is a much broader concept that encompasses both traffic-based and mobility-oriented analyses and is not just limited to the ability to reach destinations (Lättman et al. 2016; de Oña et al. 2013; van Wee, 2016; Cheng and Chen, 2015; Yatskiv et al. 2017; Litman 2009). However, each of these accessibility goals cannot be achieved all at once and the policy outcomes face a trade-off. Improved and efficient transportation system also enhances the well-being of commuters by mitigating stress-causing factors such as traffic jams, discomforts, and missing connectivity among different modes of transport. The common measures of accessibility are summarised in Table 2.

Table 2: The Common Measures of Passengers' Accessibility

Accessibility type	Measure
Accessibility by demographic and economic profile	The transportation intervention must be non-discriminatory and socially inclusive
Accessibility by destinations	The benefits can be divided into three broad categories, i.e., access to livelihood, access to key services (health/education], and access to a better quality of life (shopping/recreation)
Accessibility difference	The difference between past and present modes among those individuals who had access to the motor and those who did not, belonging to vehicle-lacking and vehicle-owning households
Physical accessibility	It captures the ease of travelling between or among different locations of Lahore, which is further divided into two aspects, i.e., mobility and connectivity a) Mobility reflects the transit travelling speed, distance and time including the time to reach the access point and change of stations b) Connectivity measures the transit coverage or catchment area within 60 minutes, distance from the origin to access, distance to the end destination, and availability of feeder buses/car parking, and bike stand
Affordability	The cost of the current mode of travelling as compared to other modes of transport relative to the commuter's income
Convenience	Factors that influence rider's decision in favour of the current transportation mode against other competing modes such as availability of travel information, commuters' comfort, and safety etc.
Social acceptability	The social status of commuters, i.e., measuring accessibility by different income groups
Temporal accessibility	This measure will capture the riders' perceptions about the reliability of the transit service i.e., how often and for how long the transit is used

Source: Adapted from the existing literature (El-Geneidy and Levinson, 2006; Ascher, 2007; Kenyon et al., 2002; Fransen et al., 2015; Bocarejo and Oviedo., 2012; Lättman et al. 2016; de Oña et al. 2013; van Wee, 2016; Cheng and Chen, 2015; Yatskiv et al. 2017; Litman, 2009).

A problem that sometimes arises during the ex-ante feasibility analysis is that it produces different results in comparison to the ex-post evaluation due to missing information on competing transportation modes or borrowed evaluation methods which may not be comparable. In addition, it is noteworthy that transportation is often considered as a means and not an end, i.e., it is considered as a means of providing mobility. However, various additional user benefits can be observed at the end of the trip, such as access to various urban facilities.

Government Interventions Specific to Mass Transit: The 3S Elements

In modern times, for achieving the objective of viable and efficient urban mobility, transportation policies should focus on designing such transit systems that are 'sustainable, safe and smart' (Haque et al. 2013). These are the three key elements (3S) that can increase economic efficiency, social equity, and environmental justice in an economy. However, achieving intergenerational equity is an essential element of a safe and sustainable transportation system.

Earlier, the efficiency in transport strategies and policies was meant to increase the number of roads for ease of travelling. On the other hand, this led to many socioeconomic issues like urban sprawl and more use of private vehicles resulting in urban road congestion. Such transport-related policies further exacerbated the situation in the form of environmental degradation, noise pollution, higher fuel consumption, emissions, and depletion of natural resources. Therefore, the world development agenda at present is focusing on such transport policies and measures that are sustainable and environmental-friendly. Many policies have been developed to tackle transport-related issues such as designing compact-city plans (Sung and Choo,2010), transit-oriented policy interventions (Sung and Oh, 2011), controlling motorisation (Han, 2010), promoting public transport (Ibrahim, 2003), and increasing the trend of non-motorised mobility (Shirgaokar et al., 2010). Moreover, policies like vehicle quota system (VQS) and congestion charging schemes, restrictions on vehicle ownership, and imposing road pricing are vital measures to encourage the use of public transport and mass transit system. For better utilisation of public transport, there is a need to ensure proper service standards, such as safety, which can only be attained by promoting competition among public transport operators. Therefore, there is a need to focus not only on the development of transport infrastructure but also improvements in the quality of service delivery on the principle of sustainable, safe, and smart transport.

Social Inclusion as Justification for Government Subsidies of Transportation Services

Public sector transport is one of the key elements in creating gender equality and inclusivity in society as envisioned in the 2030 Agenda for Sustainable Development. According to a recent report by United Nations (2020), public transport is a means to poverty alleviation by providing a supportive role for equitable social development via improving social mobility and enhancing connectivity.[2] Safe and inclusive transport plays a role in achieving social inclusion by bringing various socioeconomic opportunities for citizens. A well-planned transportation policy integrates society by providing basic mobility to the ends (Unite Nations, 2020). It is believed that a transportation system causes a 'domino effect' by leaving no one behind and creating a participatory environment for everyone. The public transport interventions, such as the light rail mass transit networks, also support environmental sustainability and mitigate road congestion by reducing the number of private cars (Ardila-Gomez & Sanchez; 2016).

The feminisation of the labour force is also not possible without the presence of an urban public transit system. Women face 'forced immobility' as they are mostly motor-less and involved in trip-chaining for the accomplishment of their several roles between work, household, and family care. Therefore, the non-supportive and non-availability of affordable, safe, and well-connected transit systems marginalise women to a larger extent who may turn down many good economic opportunities. The provision of well-integrated mass transit networks along with shuttle bus services can enhance gender inclusiveness and the female workforce can be more productive to become a source of support for their families. Gender differences in mobility are also one of the reasons that force women to engage in the informal sector or self-employment closer to their homes where they are either underpaid or unpaid. Therefore, there is a need to sensitise the transport and transit systems towards gender inclusiveness (United Nations, 2020). This can be done by creating awareness of the benefits reaped

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[2] United Nations report ESCAP/CTR/2020/4, "Safe and inclusive transport and mobility".

through public transportation facilities and working on legislation. Legislation is the missing element in the case of developing economies, causing public mass transit systems to be less inclusive and unattractive for each segment of society (United Nations, 2020).

Traditionally, transportation policies and interventions usually aim to focus on the economic impact in the context of connectivity, while the social benefits are assessed as a by-product of infrastructure development and the increase in the volume of goods and passengers being transported. The social impact of public transport is assessed in terms of reaching a range of destinations within reasonable timeframes and costs. However, in developing economies, 'transport poverty' is also a visible phenomenon causing transport-related deprivations and geographic isolation for vulnerable socio-economic groups, individuals, and households alike. There is a need for governments in developing economies to target such transport interventions that ultimately lead to social exclusion for individuals facing high physical immobility. In addition to mobility barriers, the availability of alternative transport options, fare structure, and travelling environment are also some important issues that relate to 'transport poverty' (Lucas et al., 2016).

A well-planned urban transportation system has a great impact on labour market turnover by reducing transportation costs and increasing accessibility. Urban sprawl is detrimental to job search and job retention when there is poorly developed transport infrastructure. This is mainly due to the limited availability of commuting services or high travelling costs (Gobillon, Selod & Zenou, 2007; Gobillon & Selod, 2021). These factors may result in a higher incidence of poverty. The poor, unskilled, and the vulnerable are unable to benefit from employment opportunities due to poor connectivity between the job market and their place of residence (Berg er al. 2017) in addition to the increased travelling costs. Rospabe & Selod (2006) further explained the spatial mismatch hypothesis that there is an adverse impact of residential segregation and commuting lengths on unemployment levels. On the other hand, the high commuting costs lower the real wages, which discourages the workers to retain their jobs. In addition to the impact on the labour market, an improved transportation system also affects educational choices and the demand for healthcare services. Therefore, the connectivity, mobility, and affordability of public transport play an important role in achieving social inclusion. The argument of social inclusion is considered a strong justification for subsidised public sector transport services.

Sources of Public Funding for Transportation

Urban transportation is an indispensable tool for economic development and raising the quality of life as it provides access to work, education, recreation, and other community services. It has been observed that transit systems provide 'compact development opportunities' by encouraging walkable communities. However, it is very rare, especially in the context of government provision of mass transport services, that successfully recovers the full cost through passenger fares. To establish an 'affordable' as well as vibrant mass transit system, authorities need to ensure its financial sustainability, i.e., rather than relying on government subsidies, significant revenues must be generated to pay for new capital investments as well as to finance the maintenance and operational costs of existing facilities and services. Transit systems usually face recurring losses in their operational expenditures (Ubbels et al., 2001).

Nevertheless, worldwide experience highlights the importance of mass transit in reducing road congestion by shifting the travel demand of car owners towards affordable public transport. The additional benefits are reaped in the form of lowering the environmental costs through a pollution reduction, and reduction in accidents and auto fatalities. Above all, other observable benefit includes the increased value of property near the transit stations and routes, preservation of fuel, and availability of labour pool for businesses. Therefore, mass transits are always associated with greater public benefits and such policy interventions are deemed necessary despite their enormous capital and operational costs. Multiple ways are designed under an integrated transportation policy to finance such services. This is not only done by imposing direct/indirect taxations but rather additional levies of various forms are also introduced. Nowhere in the world, a mass transit service can be found where costs

are fully recovered by passenger fares. Hence, the biggest challenge in introducing such transit systems is how to pay for them. Ideally, the funding system for a transit system should have all the essential qualities like enhanced market efficiency, low collection costs, reliability, and fairness.[3]

The funding options need to be cost-effective and each option must be evaluated through the lens of potential revenue, predictability and sustainability, horizontal and vertical equity, travel impacts, strategic development objectives, public acceptance, and ease of implementation (Litman, 2014). Transport systems face a myriad of financing challenges. Mass transit fares can only cover a limited proportion of the operating costs, leaving nothing for further capital investment. The current revenue generation can be utilised only to keep the existing system running rather than to start new services and even those expenses might also not be fully balanced.

The developing countries experience under-investment in urban transport due to which cities are stuck in the underfunding trap. The upfront investment in new transport infrastructure is huge, which may be available from external sources if domestic resources are scarce. However, revenue generation from a poorly managed tax system, inadequate demand for poor quality transport, and passenger fares are insufficient which fail to cover the maintenance and operation expenses. This urban transport financing gap is largely found in developing economies, which is further widened by implicit subsidies. In addition, the users of personal vehicles are responsible for huge social costs in terms of congestion, sprawl, accidents, and pollution. Hence, there is a need to address this issue by discouraging the use of private vehicles and introducing new options for public transport to the masses. All these measures are conditional on funding sources for such huge investments.

Financially viable and sustainable transportation projects are the need of the time for developing economies, which are overpopulated and rapidly urbanising. The literature highlights the concept of 'Who Benefits, Pays', which is being formulated for achieving a financially sustainable public transport system (Ardila-Gomez & Sanchez, 2016). Financial sustainability is measured in terms of permanency and stability, political recognition, and administrative ease in the case of instrument implementation, while transport sustainability is gauged in terms of economic efficiency, social equity, and environmental impact. The governments in developing economies must make public transport investments that can decrease the financing gap by reducing the existing expenditures over time. Public transport investments should also focus on transport sustainability.

The public transport system is funded through numerous ways both at the federal, provincial, and local levels. The different sources of funding include the imposition of various kinds of taxes such as sales tax, property tax[4], income tax, discounted bulk transit passes,[5] fares, and fare-related income.[6] However, the major share always comes from federal sources and a transit funding formula that may vary from year to year or from one budget cycle to another.[7] In many countries taxes on motor fuel is another significant source of financing the public transport services. Vehicle taxes can also be a source of funds.

The system-generated revenue from any transit system also works as a financial source but its share remains quite low and may not lead to financial sustainability. Therefore, there is a need to tap into additional and sustainable sources of fund generation where the burden is shared by various entities and not solely by the commuters. Literature suggests developing an urban transport financing system that is based on an appropriate mix of complementary financing instruments, possibly involving multiple levels of government and different sectors. More appropriately, a combination of grants and loans from funding agencies combined with investments

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[3] For details, https://uspirg.org/reports/usp/why-and-how-fund-public-transportation

[4] See Ardila-Gomez & Sanchez (2016) for more details. Property tax is considered as a key financing instrument for capital, operation, and maintenance expenses for urban transport funding.
http://dx.doi.org/10.1596/978-1-4648-0756-5

[5] See Litman (2014).

[6] See Litman (2021) for further details.

[7] For further details https://utcm.tti.tamu.edu/tfo/transit/summary.stm

through public–private partnerships (3Ps) is also an attractive solution for financing large projects that benefit society at large.

Measures for Financial Sustainability of Public Transport Services

The financial viability of public transport infrastructure is one of the most important elements for attaining a sustainable urban transport system. The reason is that these projects are heavily subsidised and the government bears most of the burden. The running cost of the Lahore OLMT project is also far greater than the revenue it generates. Therefore, it is necessary to devise strategies for achieving financial sustainability. The potential of new revenue streams is to be explored that can cut down the demand-side subsidy. These different possibilities are assessed through various measures as practised by those nations where public transport is being made more attractive and user-friendly for passengers. This is important, especially in the context of developing economies that replicate the transportation policies of developed economies to achieve similar sustainable urban mobility.

The affordability and financial sustainability of a transport system are two goals that cannot be met simultaneously. The transport service either end up relying on high levels of subsidies or charging transit fares that are too high for the city's poor. In the current scenario, the government is already bearing the cost burden and a continuous decline in OLMT passengers is being observed, which is fuelling the deficit. To incentivise OLMT usage, a further cut in transit fares is not an effective solution. Therefore, a balanced financial sustainability approach is required in the case of OLMT to limit the fiscal burden and generate revenue streams. The past literature quotes three different evidence-based revenue enhancement measures, observed in the cases of Colombia, Tokyo, Hong Kong, and Singapore, as ways to achieve financial sustainability.

i.   Private-public partnerships

ii. Cross-subsidisation

iii. Targeted demand-side subsidies

Private-public partnerships: These involve the development of commercial activities at stations and along transit routes. In addition, the provision of exclusive rights to property development can also play a role in securing returns from capital investment. This is a solution from the community's perspective through a public-private partnership of mass transit service provision. Further resource mobilisation can be generated at a large scale by encouraging commercial activities and enforcing property-related taxes due to the value enhancement of the real estate.

Cross-subsidization: This aspect caters to both the community and agency's perspective by providing a supply-side solution, i.e., generating alternative sources of financing. This transfers the burden of subsidisation to the non-users/or ex-users of the OLMT, such as increasing parking fares, fuel tax, and congestion prices as adopted in the case of the London Congestion Control Policy when many commuters switched to mass transit after being priced out of driving personal cars. However, these measures have negative externalities such as passing the direct burden of the public service provision to the non-users.

Targeted demand-side subsidies: To capture this aspect of financial sustainability, various policy options can be devised systematically by observing passengers' behaviour. This helps in targeting specific segments of society according to their needs and accessibility benefits from public transport services. By finding out who to subsidise and by how much, some burden of heavy subsidisation can be relieved and optimal strategies for revenue generation can also be planned. The policy outcome can be in the form of personalized smart cards that can incentivise OLMT usage. By increasing the number of passengers, revenue generation will help in recovering some operating costs.

3. REVIEW OF LITERATURE

Accessibility Benefits to the Public

According to Litman (2017), there has been a paradigm shift in evaluating a transportation system. Earlier, it was very narrow focusing only on traffic-based analysis in terms of traffic efficiency and cost-effectiveness. Later, the focus shifted to mobility that captures transport-based efficiency. The recent literature in the field of transport economics is focusing predominantly on improving the accessibility benefits. The first two concepts, i.e., the traffic-based analysis and mobility-oriented analysis, are nested within the accessibility-based analysis, which is a broader concept that evaluates a transportation system in terms of people's ability to reach the desired destinations (Litman, 2011). Leigh, Scott, & Cleary (1999) observed that transit systems tend to decrease the mobility gap by increasing accessibility to vehicle-lacking households, but the analysis does not take into account the unmet demand of non-drivers of vehicle-owning households.

Several mass transit accessibility measures are commonly discussed in the literature. El-Geneidy and Levinson (2006) evaluated accessibility by undertaking a detailed analysis of travel behaviour. The information was collected on destination by activities, population demographics, and how these behaviours changed over time. Ascher (2007) characterises mobility as a precondition to accessibility, i.e., the ease of travelling to workplaces, educational institutes, homes, leisure activities, and other primary facilities, such as hospitals and supermarkets (Kenyon et al., 2002; Fransen et al., 2015; Bocarejo and Oviedo., 2012). This aspect of accessibility is reflected in the connectivity of a transport system with other modes of travelling (Cheng and Chen, 2015). Hawas, et al., (2016) defines accessibility as the ease with which people can reach their destinations at lower costs and in a reasonable time. Yatskiv et al., (2017) found that reduced time and cost, along with the ease of information availability, are important factors to make public transport attractive for passengers. Litman (2009) also found that people prefer a transportation mode which reduces travelling time. Manaugh & El-Geneidy (2012) addressed an important aspect, i.e., the effect of transit infrastructure on social equity and accessibility. They explored the potential effects of transport infrastructure in Montreal by developing a social disadvantage index. The study modelled the impact of the newly proposed transport infrastructure using two indicators, namely, accessibility and the time it takes to travel. These two measures were used both at regional and personal scales for measuring the equity of the transport system. The findings showed that the transportation system in Montreal was relatively equitable but the benefits were not equally distributed. The policy implication of this analysis is to consider a balanced economic, environmental and social development in society.

Venter (2016) focused on the transportation system's accessibility component for society at large. A different set of indicators were used for measuring accessibility. The study found that the societies that have kept accessibility a priority while designing transport infrastructures are well-integrated both demographically and financially. A conceptual framework was developed describing the relevance of accessibility from the mobility angle. Infrastructure-based measures related to travelling time and cost and utility-based measures related to land use, individual preferences, and constraints were used in the study to explain the economic value of accessibility. Similarly, Lättman et al., (2016) considered reliability, simplicity, information availability, and subjective comfort as the key aspects to evaluate public transport accessibility.

de Oña et al., (2013) and van Wee (2016) measured the accessibility benefits in terms of passenger's perceptions of punctuality, payment options, travel time, number of departures, distance to the stop, and travelling environment and comfort. The comfort may include factors like cleanliness, space availability, air quality, temperature, lighting, noise, staff behaviour etc. In addition, the different indicators of information access were also considered like mobile applications, webpages, information at the stops, and onboard announcements. Di Ciommo (2018) evaluated accessibility by developing an inaccessibility index. The index reflected the number of desired destinations that people could not reach. The analysis was undertaken by considering different demographic profiles. The specific factors included in the study were comfort and ease of travelling by a transit

service, transit frequency, availability of information, and perceived security. Inturri et al. (2021) explored the impact of site location and transit connectivity on the accessibility factors of public transport in Italy using GIS mapping. Both active and passive indicators of accessibility were explored and linked with user satisfaction using MCA statistical analysis. The major finding of the study showed that the satisfaction level of students increased if universities were located in the centre of cities and directly approached the metro line without reliance on connected transport. It was concluded the accessibility is highly linked to the quality of transport services.

Saif, Zefreh and Torok (2019) undertook a detailed literature review of the accessibility perspective of public transport. The authors concluded that only door-to-door mobility can make any transportation mode attractive to the users and improve the quality of the lives of the citizens. Furthermore, it was also emphasised that a sustainable transport system is strongly linked to health care, social activities, job opportunities, and social inclusion. Therefore, policymakers need to take innovative steps to prioritise the betterment of social lives in terms of ease and comfort while planning and designing transport facilities in urban and rural areas.

Another important aspect that has been discussed regarding the accessibility of mass transit is the connectivity issue. Zho, Guo, Zeng, & Zhang (2017) talked about the importance of feeder buses in promoting the mass transit system for the Shanghai community. The authors found that connectivity services can fill the gap in easy access to mass transit public transportation and contribute towards a smooth flow of passenger traffic, which is missing in other modes of transport, such as railroads and urban bus services for smooth passenger flow. The findings of the study were based on the circular route model and the results showed that feeder service must be introduced to improve connectivity with the mass transit system. Using the graphical public-transit connectivity (PTC) index, Li et al. (2019) measured the accessibility of each building from the perspective of a public transportation network. The findings suggested that equal accessibility and equality are the key factors in making transport planning. The results showed that mass rapid transit (MRT) significantly increased the PTC index for areas near MRT routes, which means that connectivity to the buildings improved through the MRT network of transportation.

Considering the case of the Orange Line Metro Train in Lahore, Shakeel & Liu (2019) argued that this new transport intervention in Lahore can help reduce road congestion, create new employment opportunities, and deal with urban sprawl. According to the study, the commercial and residential areas along with the OLMT would promote sustainable, vertical, and smart growth of the city. The study emphasised station-wise planning of this mass transit system for the re-development of the existing potential of transit-oriented systems.

Financial Sustainability of Public Transport

Another important aspect of the public transportation system is financial viability. According to Ubbels et al. (2001), financing of public transport other than subsidy can be achieved through various kinds of financing strategies as evident in many developed economies. These include employer tax (practised in the US), property tax (Canada and the US), development levies (the US), parking charges (England and the Netherlands), charges for road space (the US), local motoring taxes (the US), consumption taxes (the US), student surcharge, and airport fee and funding through cross utility (the US). Li and Tiong (2008) provided a detailed framework for financing, operations, and fare policies for sustainable urban rail transit in Singapore. For the financial discipline of public transport, the government must not provide subsidies for service operations. However, the price-cap model is applied to regulate the transport sector monopolies to keep travelling affordable. To create efficiency in revenues from fares, the user charges can be divided into two components, viz., boarding charges and fare differentials based on distance. It is also suggested fare concessions must be targeted at particular groups, for example, senior citizens, students, and full-time national employees. In addition, periodical concessions, say, monthly, may be given.

Farebox revenue and vertical equity are the two conflicting goals in the provision of transport services which has been explored in detail by Harmony (2018). Although a reduction in user charges is more equitable for

low-income earners, it also reduces returns for the mass transit agency. The paper discussed two types of strategies from the supply and demand sides. The study concluded that organisational partnerships can considerably reduce the financial burden on the government. Additionally, the paper argued for introducing targeted demand-side subsidies and taking ridership characteristics into account for designing smart cards. Similarly, Independent Evaluation Group (2013) emphasised that diversity must be brought in financing public transport projects which is necessary for achieving sustainability. Private capital investment is considered an imperative tool in financing public transport projects. Various investment and business models have been designed by researchers to evaluate the societal impact of such private investment plans. A study by Xue et al. (2017) for the Chinese economy showed that investment plans by the private sector can enhance the economic viability and financial sustainability of public transport projects. It is suggested that targeting the two aspects of the public transportation system, namely, the provision of quality service and passenger return, can increase the efficiency of private investment in a public sector program.

However, many public policy economists also argue that using the private sector as a service provider may not be an optimal choice from a welfare perspective mostly because the private sector aims at profit maximising and not in achieving overall societal gains. On the other hand, private business and investment plans create a win-win situation. Many economies world analyse transport services from two perspectives. The first perspective is that cost-saving practices lead to maximising profits but deterioration of services. The second is that the policy of competition in business growth leads to an improvement in the quality of services. Tang & Lo (2009) provided the example of Hong Kong successfully running public transit services by following the policy of privatisation. With a few exceptions, all the mass transit facilities in Hong Kong are operated commercially and are often taken as the benchmark for their profitability and quality standards. The study also stated that the user-pays principle and fare revenue alone cannot recover the full capital costs and other forms of assistance via the private sector are necessary.

Ellis & Douglas (2015) developed a link between funding options and investment decisions in public transport development. The authors highlighted that the choice of transport-related projects based on cost-benefit analysis does not show the right decision because that analysis is independent of funding options. Therefore, there is a need to develop such a framework which could incorporate multiple funding aspects. The marginal deadweight loss must also be included which occurs when the government imposes a social cost upon the masses in the form of an increased tax base for meeting the expenses of new projects.

Budiarto (2019) explored difficulties found in maintaining the financial stability of mass transit operations in the absence of government subsidies. There is no possible way to reduce the operating costs of public transportation except to raise revenues. The possibility of a fare increase is not a solution as the fare is usually set by the government. Hence, attempts should be made to incentivise passenger use. Therefore, the government must take policy measures to switch the users of personal vehicles towards public transport. Most recently, Yusoff, Ng & Azizan (2021) analysed the case of railway development in Malaysia. According to the study, sustainable transportation is guided by multiple factors such as technological improvements, infrastructure development, regulations, awareness, pricing, and taxation. The Malaysian rail transit system is run by the government and the public has failed to shift from personal vehicles to transit services to a large extent. It was also argued that government-run mass transits essentially aim for seeking social returns rather simply the return on investment.

4. METHODOLOGY

Questionnaire Design

The primary data was collected through a researcher-administered questionnaire. A separate questionnaire was designed for non-users to find out the connectivity gap to explore the factors that can incentivise OLMT usage. In addition, the study also explored if some proportion of the non-users was ex-users and the possible reasons for no longer using OLMT. This was done to determine the potential for returning to using the OLMT service. The questionnaires for users and non-users are attached in Appendix A and Appendix B.

The questionnaire was designed by keeping in view the potential linkages of public transport accessibility benefits with sustainable future revenue streams. The data was collected on current and expected travel patterns such as the proportion of income spent, number of motorised trips taken per day, destination-wise nature of travelling, desirability in favour of the OLMT, and physical accessibility in terms of mobility and connectivity. The data weres analysed to explore the prospects of workable solutions for sustainable revenue generation. One of the solutions is through introducing personalized smart cards in the form of a bundled commodity, which may incentivise OLMT usage.

The socio-economic profile, demographics, and travelling behaviour of the users were added to the questionnaire to explore the viable solutions for devising targeted subsidies for specific age groups, gender, and the socio-economic status of the commuters to segregate users who can afford greater travelling costs. Therefore, the questionnaire was designed to capture such prospects along with the inclusion of determining the willingness to pay of the commuters. Similarly, data on employment status was also collected to propose employer-based subsidies by linking it to the livelihood destinations and their economic status. The questionnaire also collected information on multiple features related to comfort and convenience along with data on temporal accessibility. The respondents were also asked about the station of entry and exit so that zone-wise fares could be devised, such as subsidies for trips that begin and end at certain pre-determined stations. Furthermore, will be probed with the help of questionnaires the possibility of introducing monthly, quarterly, or biannual concessionary smart cards. A renewal fee for such smart cards can also help in generating additional revenue streams. In addition, the study also captured the willingness to pay indirectly to link with the demographics and socio-economic profiles of OLMT commuters. The differences in travel costs among vehicle-owning and vehicle-lacking passengers along with the OLMT travelling behaviours were also observed through the questionnaire.

Sampling Design

For conducting the OLMT passenger survey, multi-stage sampling was adopted. In the first step, the cluster sampling was adopted. The universe for analysis is the OLMT passengers. For a particular day, the OLMT ridership was divided into three clusters according to the time. The day was divided into clusters to cover the peak and off-peak hours among three parts of the day, i.e., morning (07:00 am to noon), afternoon (noon to 05:00 pm), and evening (05:00 pm to 10:00 pm) following Sajjad et al. (2017) who also divided peak hours into morning, afternoon, and evening.

There are a total of 27 train sets with five carriages on each train. After clustering the population based on timings, one cluster (for instance, morning) was randomly selected by choosing one train at a time and the passengers in that cluster were surveyed along the complete route of the OLMT (Dera Gujran to Ali Town and vice versa) irrespective of their destination station. Similarly, for the second cluster (for instance, afternoon) again one train was randomly selected for the survey and the same process was repeated for the third cluster (the evening timings). The three clusters were surveyed in a day. In this way, both the peak and off-peak hours were included. The train sets for each cluster were based on random selection. This process was repeated each day.

The common method adopted by many researchers is single-stage cluster sampling using the census approach, i.e., to survey all units within the chosen cluster. However, this approach was not feasible in the present case due to time, resource, and human resource constraints. Therefore, multi-stage sampling was adopted whereby in the second step, the convenient random sampling approach was applied to select respondents in each cluster. During the survey, some passengers refused to willingly participate in the survey and a few cases of repetitive passengers were also observed who commute daily. Such questionnaires were treated as non-responses. The no-response rate was 4.6 per cent.

The main objective of the present study is to measure accessibility benefits and devise strategies for the financial sustainability of this mass transit service through targeted demand-side subsidies. Therefore, the target population were passengers who commute using the OLMT. Since the existing literature cites the accessibility measure from the passenger's perspective because there are no accessibility gains for those who are not directly involved in consuming the mass transit service. Secondly, the targeted demand-side subsidies can only be applied to the OLMT users and not the non-users.

However, a small sample of 500 non-users, of which some might have been ex-users, was also selected to undertake a comparative analysis with users to explore the reasons that discouraged them to become users. The target population for this survey round were the commuters who travel along the roads parallel to the route of the OLMT. The mode of travel of these commuters is rickshaws or minivans. For this purpose, simple random sampling was adopted. To undertake a comparative analysis of users and non-users, a subset of 500 respondents was extracted from the total sample of 4,900 OLMT commuters. The subset was created by excluding case-by-case missing values for any of the items for which the respondent did not provide a response trimming the data to 3,000 cases. Furthermore, systematic sampling was used to select every sixth case. Out of 500 non-users, 67.5 per cent were ex-users of the OLM, and 32.4 per cent had never used the OLMT.

Sampling Frame

The field survey was conducted over two months starting from September 01, 2021, to October 28, 2021. The micro-level primary data was collected by conducting an on-site rider survey of the commuters who commute via Lahore OLMT. Nevertheless, a few challenges were faced during the conduct of the field survey, such as repetitive OLMT passengers, refusal to voluntarily participate in the survey, and public holidays. Sundays were excluded from the time framework because it was observed during the pilot survey that the majority of the Sunday commuters were one-time riders consisting of groups of families or friends that rode the OLMT solely for entertainment and joyrides. Thus, their travel behaviour would not have provided fruitful information to achieve the research objectives. A small sample size in the case of non-users was also collected to find out the mobility gap that discourages the non-users. The field survey of non-users lasted one and a half months from November 30, 2021, to January 13, 2022.

Scale of Analysis and Survey Design

The scale of analysis was the complete OLMT route starting from the Dera Gujran Station to Ali Town Station and vice versa. At first, the pilot survey was conducted. During the pilot run, the researchers observed only minor adjustment needs, and the questionnaire and mode of conduct were modified accordingly. The research ethics were also taken into consideration by taking verbal consent from the respondents before the administration of questionnaires. The survey was conducted through researcher-administered questionnaires on OLMT commuters during the time of their ridership. The rationale for not choosing individual OLMT stations (26 in total) was a severe time constraint. Since the time duration between the arrival of consecutive trains at any OLMT station is roughly 5 minutes and OLMT commuters had no incentive to willingly participate and stay back for the completion of the questionnaire rather than their OLMT ride. Thus, questionnaires would have remained partially filled or the non-response rate would have been very high. Therefore, it was more feasible to survey the

OLMT route onboard during the ride as respondents were more willing to participate in the survey onboard.

On the first few days of the pilot survey, it was observed that self-administered questionnaires also posed a serious challenge in terms of missing information. This was because the respondents took a considerable amount of time in reading and understanding the survey form before filling it out. Hence, before they could complete the questionnaire, they had to get off the train by either leaving behind the partially filled questionnaire or taking it with them. In both cases, the questionnaire was considered a waste. In light of these observations, the survey design was modified to researcher-administered questionnaires. Apart from OLMT passengers, the non-users of OLMT were also surveyed to identify the accessibility gap that discourages them to use the OLMT. The non-user respondents were searched along public roads that are running parallel to the OLMT route (Dera Gujran to Ali Town and vice versa) and commuted via minivans and rickshaws.

Analysis

The analysis was done by using descriptive statistics, frequency distribution, multiple charts, stacked bar charts, pie charts, and contingency tables/cross-tabulations. A comparison was also undertaken between the two independent samples of users and non-users. The independent variable is categorical, either nominal or ordinal, but the categories are dichotomous such as the users and non-users. The nature and datatype of the dependent variable determine whether to use a parametric or non-parametric approach. The parametric approach is applied when the dependent variable has a continuous scale (ratio or interval) and has a normal distribution. The non-parametric approach is used when the dependent variable is continuous but skewed, i.e., does not have normal distribution or the dependent variable follows an ordinal scale.

The current study has used an ordinal scale for most of the items in the questionnaire except for a few variables that have continuous scales, such as approximate daily expenses using public or private transport and willingness to pay for pick-and-drop service between the place of residence to the destination location. The Shapiro-Wilk normality test was applied to scale variables since the dataset is small consisting of 500 users and 500 non-users. Since a significant p-value rejected the null hypothesis of normal distribution (see Table 6, Appendix C), the study employed a non-parametric approach to undertake the comparison of two independent samples of users and non-users.

The Mann-Whitney U test was used to test the hypothesis of whether the two independent groups are significantly different or not. The Mann-Whitney test converts the scores of the ordinal scale into ranks for the complete sample without grouping and the mean rank of the two groups is then compared. The null hypothesis of a significant difference between the ranks of two groups (users and non-users)was rejected. An insignificant test result shows that both groups were drawn from the same underlying population, i.e., there is no sizable difference between the users and non-users. In addition, the odds ratio was also calculated to determine the travel demand and behaviour of the users and non-users with respect to connectivity and willingness to pay. The odds ratio measures the effect of one unit change in an independent variable in the predicted odds ratio by keeping other variables in the model constant.

5. RESULTS AND FINDINGS

The notion that a successful public transport system fully pays for itself through passenger fare revenues is a common myth; rather, it delivers vast external benefits in the form of social inclusion. Social inclusion for vehicle-lacking individuals belonging to motorless households provides economic justification for government intervention and subsidies. However, to reduce the burden of government subsidies, targeted demand-side subsidies are a viable policy option rather than uniform fares. The public-private partnership can also generate

additional revenues through commercial activities.

To fully reap the benefits, there is a need for a well-integrated plan of action to make transport policy compatible with new service provision and infrastructure development, especially mass transit interventions. The most important aspect is supplementing the mass transit rail with a network of connectivity to encourage its use. Additionally, public awareness about the Lahore transportation network can also help to increase the OLMT ridership as the information gap is found to have restricted the non-users to shift towards OLMT from the present mode of travelling despite facing discomfort and inconvenience. The detailed analysis is provided below.

Figure 2 shows the distribution of OLMT commuters by gender, which is representative of both male and female populations. Furthermore, the breakdown of the sample by employment status is also provided. The Lahore OLMT has contributed towards a gender-inclusive transportation mode by improving the transportation access to female students as depicted by 17.1 per cent passenger share compared to male students (15.8 per cent).

Out of the total sample size, 51 per cent were OLMT passengers since its opening followed by 14 per cent of passengers who had used the mass transit facility for more than 6 months. The data also shows that the transit train has brought locational efficiency through easy access to destinations (Figure 3). Sustainable accessibility to city residents in terms of access to workplaces, educational institutes, and homes is among the various objectives of an urban transport policy as highlighted by Haque and Rizwan (2020).

The greater proportion were those commuters whose ultimate destinations were workplaces and educational institutes. In terms of the reach to local community services and hospitals, the regular passengers were only 7 per cent, whereas 80 per cent of the passengers never used it for this purpose. Hence, targeted demand-side subsidies can be offered to office workers and students in the form of special smart cards which might induce more people to shift towards the OLMT use to increase revenues. Harmony (2018) has also emphasised designing smart cards specific to users' characteristics. An expiry date and renewal fee for smart cards can be an additional source of revenue for this mass transit service.

Out of the total sample, 56 per cent of the respondents were residents of Lahore since birth and 12 per cent had been residing in Lahore for more than 10 years. When asked about their experiences with Lahore transportation, 78 per cent of the passengers responded that transportation options were adequate in Lahore. i.e., they had easy access to public transport in terms of ease to reach their destinations. This indicates that the past policy interventions in the Lahore transportation system have brought improvements to overcoming discomforts and increasing the utility of the citizens.

Further breakdown of the sample reveals that among the permanent residents of Lahore, 78 per cent of the respondents found the transportation system of Lahore adequate, whereas 17 per cent were dissatisfied in terms of inability to reach their destinations with ease. On the other hand, 17 per cent of the passengers who had been residing in Lahore for less than 5 years responded affirmatively on the adequacy of transportation. The travel experience of OLMT commuters is provided in Figure 4.

(a)

Figure 2: Gender Profile of OLMT Commuters and Distribution by Employment Status

Employment	Percentage
Employed	51%
Self-Employed	7.4%
Un-employed	1.8%
Student	32.9%
Housewife	6.9%
Retired	0.1%

(b)

Employment status by gender
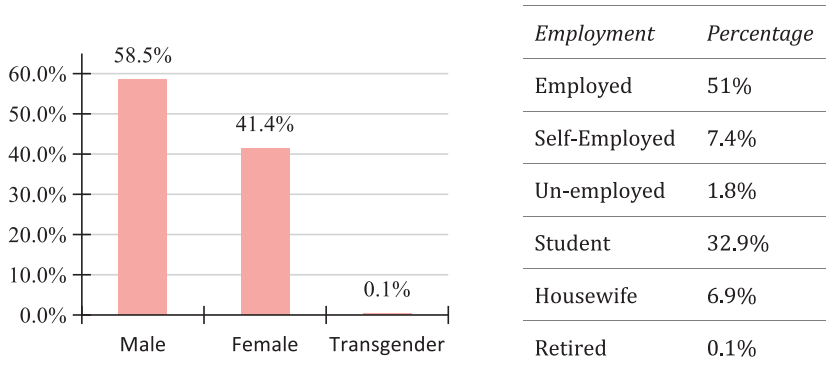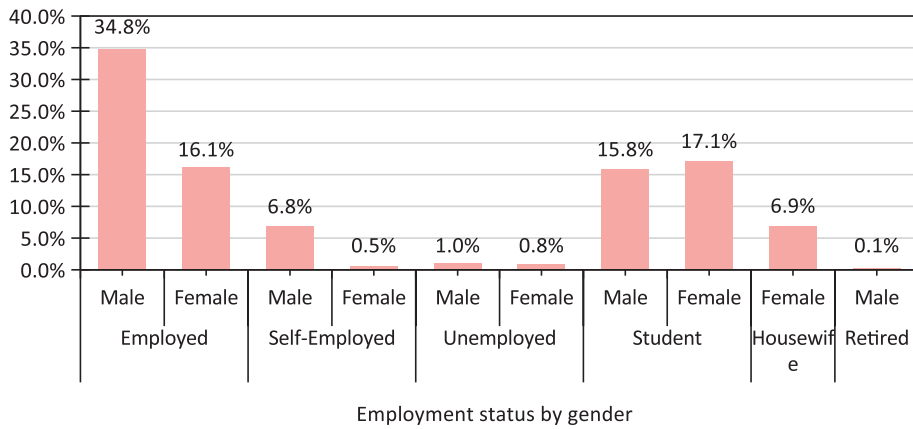
Source: OLMT Ridership Survey

Figure 3: Accessibility by Destinations and Duration

Destinations	Percentage share of OLMT commuters
Workplace (A)	44%
Education (B)	27%
Both (A+B)	3%
Recreational activities (C)	16%
Shopping (D)	6%
Both (C+D)	20%
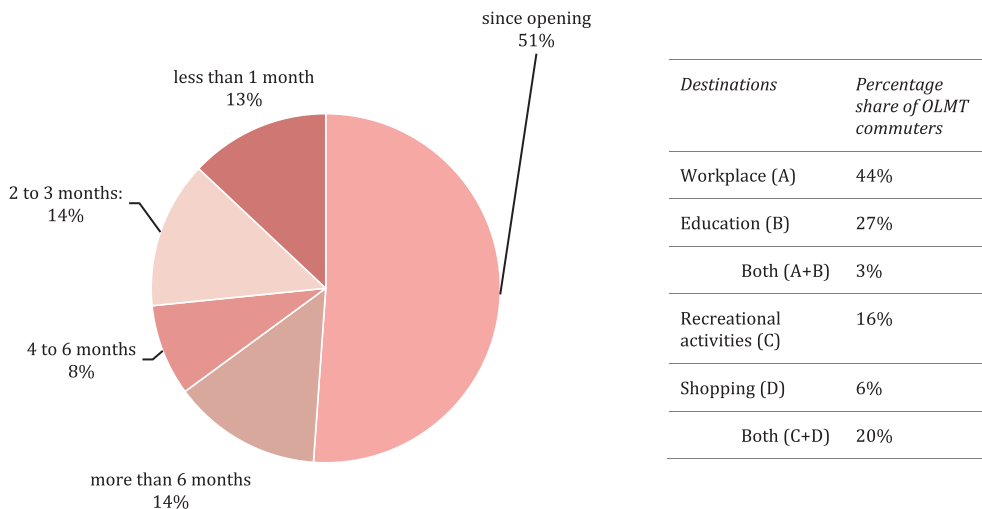
Source: OLMT Ridership Survey

Figure 4: Travel Experience of OLMT Passengers with the Lahore Transportation System in Terms of A) Overall Satisfaction and B) Observable Travel Restrictions
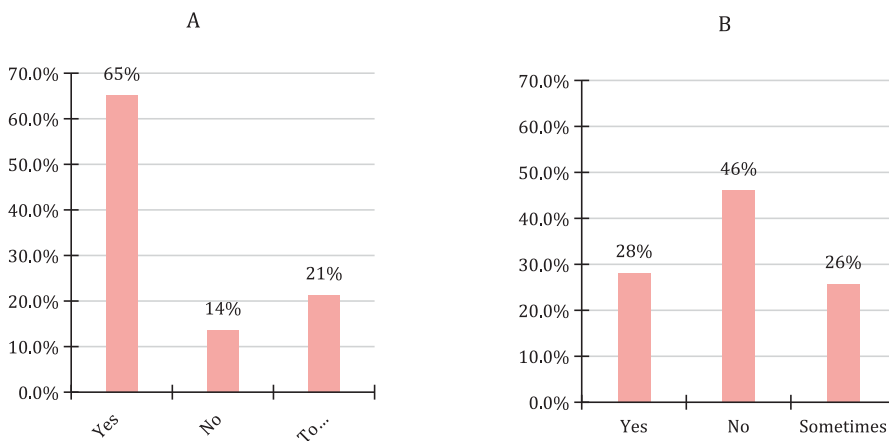
Source: OLMT Ridership Survey

The comparison of daily expenditure costs of travelling and alternative modes of transportation of the passengers before shifting towards OLMT is provided in Figure 5. The previous mode of transportation of the majority of commuters was rickshaw followed by the use of personal vehicles. Moreover, the users of personal vehicles were mainly owners of two-wheelers. Thus, the passengers shifting to the OLMT from these two alternative modes (rickshaws and two-wheelers) can greatly contribute towards greener transport in Lahore. The available literature has also mentioned that one of the important aspects of light rail mass transit, other than accessibility, is to achieve environmental sustainability in the long run. This is achieved by lowering greenhouse gas emissions, using renewable energy as in light rail transits and reducing the trip length of private vehicles through improved connectivity.

Lahore is among one of the severely affected cities of South Asia by smog. According to a 2002 report by the World Bank, Pakistan and India are the main culprits of greenhouse gas emissions and suspended particulate matter in South Asia.[8] The report also highlights that motorcycle and rickshaw usage are the major factors behind such environmental degradation as no environmental standards have been issued for these transportation modes.[9] In addition, such factors may also influence reducing the space footprint and road congestion. Another shift factor in favour of the OLMT was the past daily travel expenses as 36 per cent of the commuters previously spent more than Rs. 200 followed by 21 per cent spent approximately Rs. 150 to Rs. 200. Only a small proportion of commuters (5 per cent) bore per-day travel cost of Rs. 40 or less, which is equal to the OLMT fare (see Figure 5).

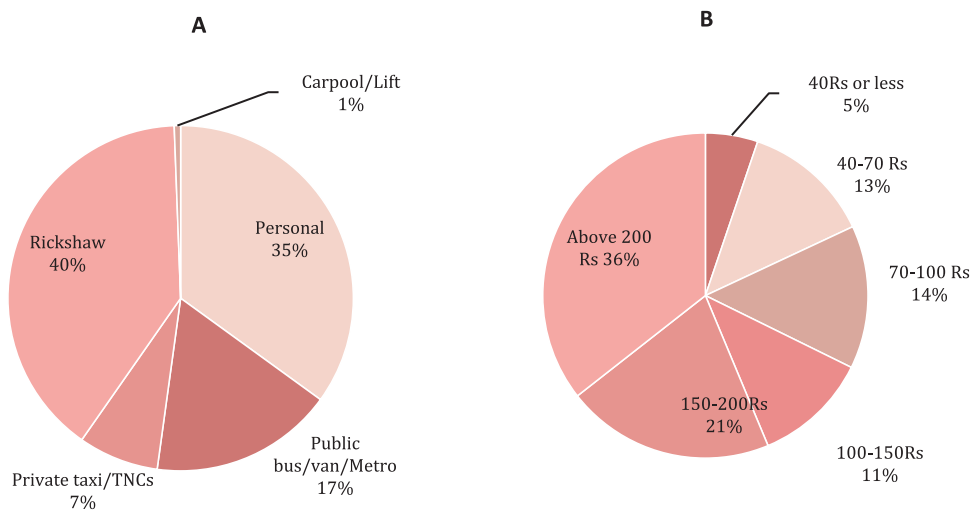*Figure 5: Passenger Characteristics before Shifting towards The OLMT Use in Terms of A) Alternative Transportation Mode and B) Daily Travelling Cost of the Alternative Mode*

Source: OLMT Ridership Survey

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[8] World Bank (2002).

[9]   United States, European Union, Singapore, Shanghai, and Japan are the leading countries of the world that follow stringent vehicle emission standards along with pursuing technologies, such as electric cars and e-powered mass transit, to further reduce emissions.

Furthermore, it was observed that 32 per cent of the passengers previously spent Rs. 70 daily on rickshaws, which forced them to shift to the OLMT. On the other hand, 22 per cent of the OLMT commuters, who were previously using personal vehicles, were bikers with an average cost of less than Rs. 200 per day and 13 per cent were car users with travel expenses of more than Rs. 200 per day. Figure 6 gives a detailed breakdown of daily travelling costs for different transportation modes.

Figure 6: Comparison of daily cost under alternative transportation mode
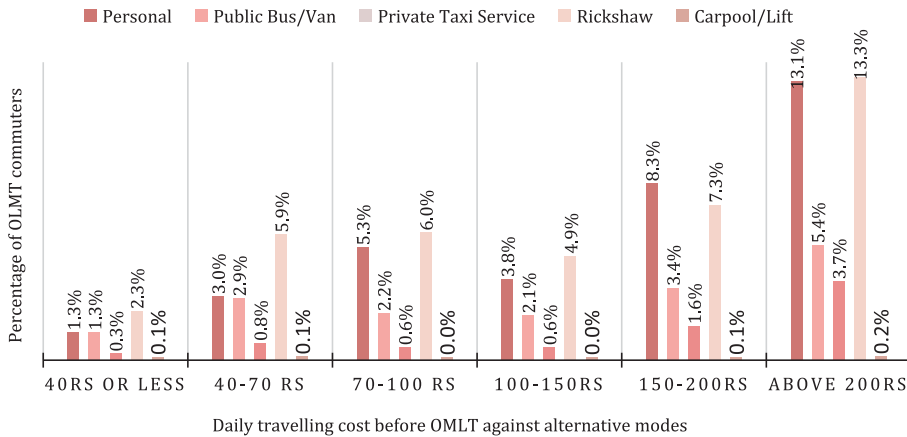
Source: OLMT Ridership Survey

Although the public has a strong inclination to be free riders by not revealing their true preferences but still majority showed acceptance of a fare increase. Thus, OLMT fares can be increased without a considerable fall in demand. The future demand along with the willingness to pay and acceptance of price increase is depicted in Figure 7.

Figure 7: Future Demand for OLMT Ridership A) Without Fare Increase and B) With Fare Increase
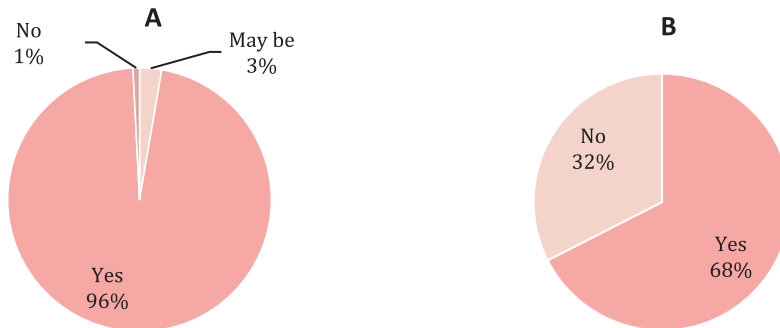
Willingness to Pay if the Fare is Increased by:	Rs.10	Rs.20	Rs.30
Yes	74%	39%	25%
Maybe	5%	9%	7%

Source: OLMT Ridership Survey. Note: The passengers were provided a hypothetical situation of fare increases of Rs. 10, Rs. 20, and Rs. 30.

Figure 8: Willingness to Pay by Income Profile for Additional Rs. 10, Rs. 20 and Rs. 30
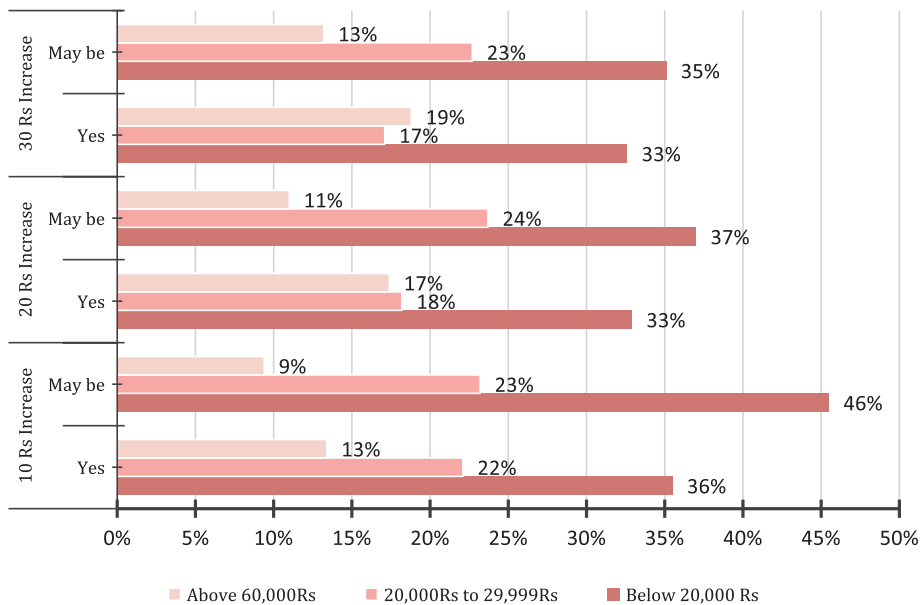
Source: OLMT Ridership Survey. Note: The income groups were classified into six categories (i) below Rs. 20,000 (ii) Rs. 20,000 – Rs. 29,999 (iii) Rs. 30,000 – Rs. 39,999 (iv) Rs. 40,000 – Rs. 49,999 (v) Rs. 50,000 – Rs. 59,999 (vi) Above Rs. 60,000. In the figure, statistics of only those income groups are included that show considerable variability.

Figure 8 shows that the majority of the passengers who revealed their willingness to pay an additional Rs. 30 and Rs. 20 belonged to the Rs. 60,000 and above income group (19 per cent in the case of Rs. 30) or the less than Rs. 20,000 income group (33 per cent in the case of Rs. 30 and Rs. 20). On the other hand, the majority of passengers who agreed to pay additional cost of Rs. 10 earned less than Rs. 30,000. It is interesting to note that low-income earners showed greater willingness to bear the extra burden of fare increases despite having limited income. This public transport service has contributed greatly toward social inclusiveness for low-income earners as they are more willing to bear a fare increase because these commuters either do not own private vehicles or belong to motorless households. Therefore, third-degree price discrimination on the concept of progressive taxation can be applied by issuing smart cards for different income groups by further categorising them into regular and non-regular commuters. This may increase the revenue of the mass transit authority.

Figure 9: Distribution by Vehicle Ownership and Availability by A) Personal Ownership and B) Household Ownership
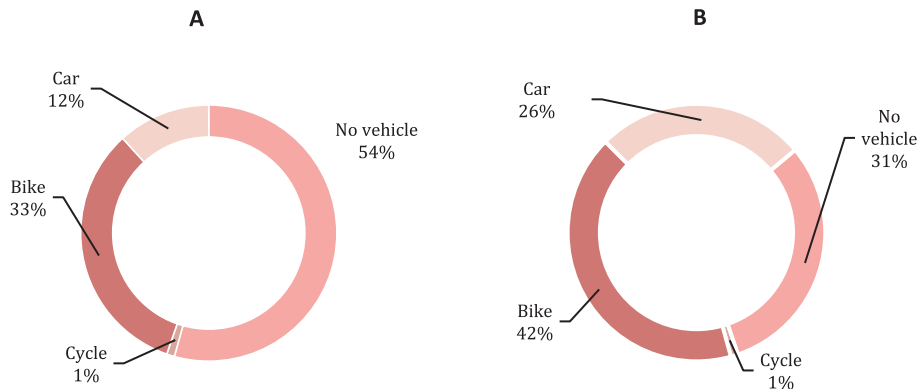
Source: OLMT Ridership Survey

Figure 9 illustrates that many of the commuters neither owned personal nor their households owned any vehicle. However, 12 per cent of the commuters owned personal cars and 33 per cent were the owners of two-wheelers, which reflects the proportion of 'choice riders,' i.e., those who owned personal vehicles at the time of ridership. Although the OLMT has also benefitted those who ride OLMT by choice, a larger proportion of the OLMT users is of those who have shifted to the OLMT because of the non-availability of alternatives. These riders consisted mainly of those commuters who either did not own a vehicle or relied on a family member for shared travelling on a jointly owned vehicle. 48 per cent of the OLMT commuters had no personal or household ownership of vehicles and used rickshaws before the use of OLMT. Seven per cent were using private taxi services using TNCs. Thus, this mass transit has been very beneficial for a large segment of society by providing them with basic mobility. For these users, it was difficult to make trips to their destinations and also faced higher travelling costs to use alternative modes, mainly rickshaws. Interestingly, it was also found that most of the motorless commuters who belonged to vehicle-owning households were females. Upon further inquiry during the survey, it was found that their alternative mode of travelling was a bike which was personally owned by a male member of their family. Hence, females face 'forced immobility' due to dependency on a family member for shared ridership, but the mass transit service has contributed considerably to overcoming this barrier for females as this service is considered safer and more convenient.

Table 3 provides the distribution of the OLMT passengers by different income profiles. The majority (59.2 per cent) fell below the Rs. 30,000 income level. Correspondingly, an equal ratio (60 per cent) of non-users who had a similar income level commuted via alternative public transport such as minivans or rickshaws instead of OLMT. The non-users (59.4 per cent) faced problems of traffic congestion on roads almost daily while travelling using alternative modes. However, further exploration of the reasons why they did not prefer the Lahore OLMT over their current mode was the lack of knowledge and awareness about the connectivity networks. Thus, it is the lack of information that induced them to use alternative transportation modes, especially informal public transport modes (such as rickshaws). The proportion of these non-users was 67.7 per cent.

Table 3: OLMT Passenger Distribution by Income Groups

Income Range	Percentage share
Above Rs. 60,000	11.4 %
Rs. 50,000 - Rs. 59,999	8.3 %
Rs. 40,000 - Rs. 49,999	8.7 %
Rs. 30,000 - Rs. 39,999	12.4 %
Rs. 20,000 - Rs. 29,999	23.5 %
Below Rs. 20,000	35.7 %

Source: OLMT Ridership Survey

Additionally, it is noteworthy that 35 per cent of respondents, who commuted via OLMT, were either completely or partially satisfied completely with the transportation system of Lahore. These passengers were previously rickshaw users and 30 per cent were users of personal vehicles who had shifted to the OLMT service.

Figure 10: Comparison of Monthly Income and the Proportion of Passengers Using Alternative Transportation Mode Before Shifting to the OLMT
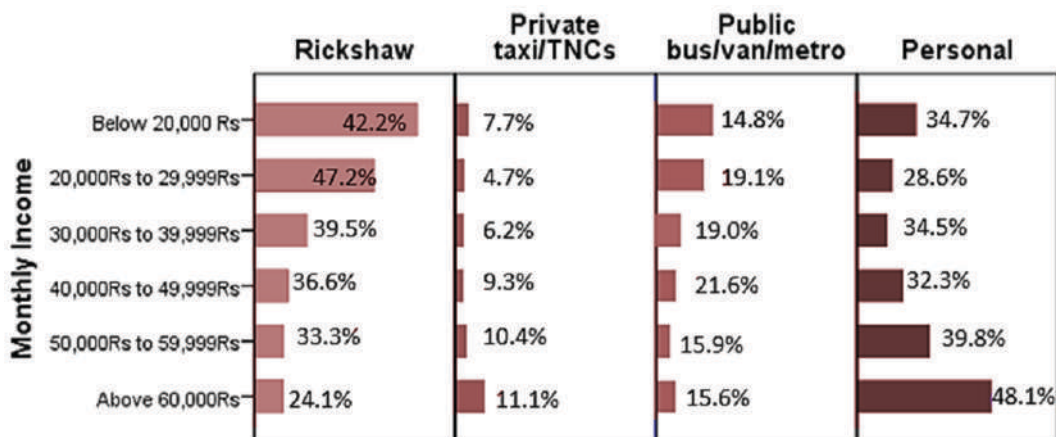
Source: OLMT Ridership Survey. Note: The percentage values in the rows are the shares of the OLMT passengers who previously used alternative transportation modes by income groups. A minimal percentage (less than 1 per cent) used carpool/shared transport is not reported in the figure.

Figure 11: Representation of Connectivity Gap A) From Residence to the OLMT entry station and B) From OLMT Exit Station to the Destination

A

Taxi 2%
Rickshaw 33%
Walk 38%
Bus/ Van 4%
Car 6%
Bike 17%

B

Direct destination 16%
Use additional transport to reach destination 50%
Walk to Destination 34%
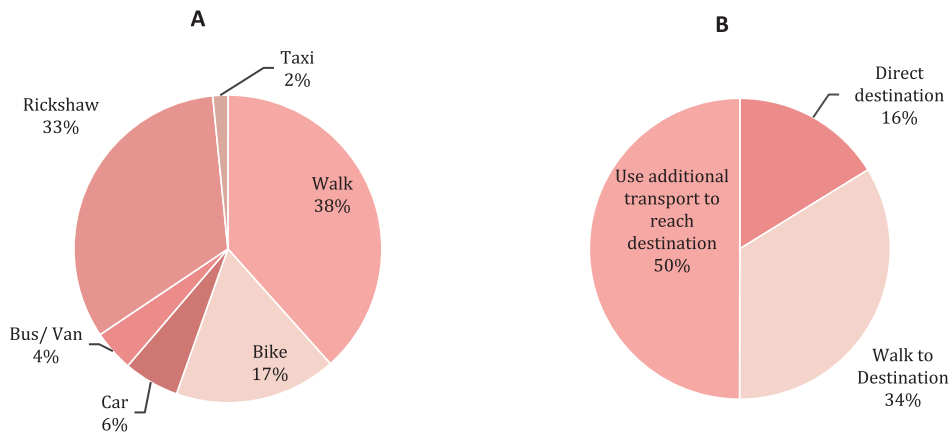
Source: OLMT Ridership Survey.

Out of the total sample of OLMT passengers, 40 per cent ¬¬of the passengers used additional transport along with the OLMT (both entry and exit stations). 10 per cent of the passengers reached directly to the OLMT entry station but used additional public transport at the exit station to reach the destination. 5.9 per cent used personal vehicles (such as bikes and cars) and 4.4 per cent of the passengers used public transport (both formal and informal, such as public buses, rickshaws, and taxis) to reach an OLMT station but no additional transportation was used at the exit station. On the other hand, 28.5 per cent of the passengers did not require any additional transport along with the OLMT service (at both ends, i.e., entry and exit stations). Therefore, the overall cost of travelling increased due to the additional burden of multi-modal commuting to and fro OLMT stations as compared to travelling using the OLMT service only. This shows that improving the connectivity gap can induce more people to use the OLMT. Network connectivity is considered one of the important aspects of improved mobility (Venter, 2016). Haque and Rizwan (2020) identified that the gap between the supply and demand for mass transit systems in Pakistan is filled by inferior transportation modes, such as rickshaws and motorbikes.

OLMT passengers experienced a considerable reduction in the mobility gap in terms of time, distance, and travel costs. Also, a large proportion of passengers found the OLMT to be cheaper, safer, and more comfortable as compared to competing modes of transport. Furthermore, it was observed that the majority of the users had to travel a distance of more than 2 km to connect to the OLMT stations in comparison to the non-users who travelled 1 km or less if they needed to reach the nearest OLMT station. This shows that rather than the proximity of the OLMT, improved physical accessibility, convenience (cheap, safe, and comfortable), and mobility (time and distance) were the contributing factors for derived demand for the OLMT mass transit. The contribution of the OLMT in improving physical accessibility is provided in Figure 12.

Figure 12: Physical Accessibility through A) Mobility and B) Convenience
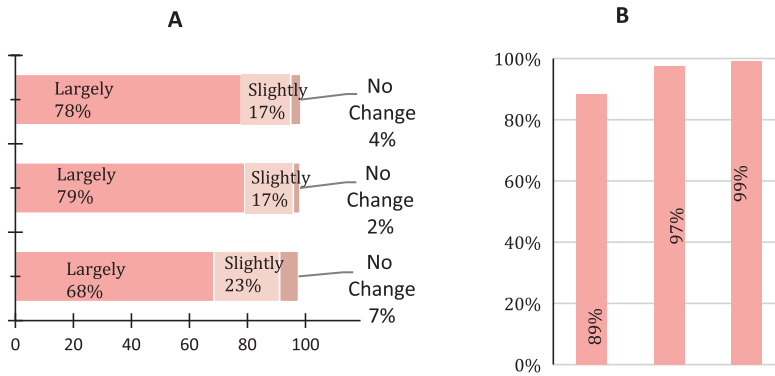
Of those who found the OLMT to be a cheaper mode of travelling, 63 per cent reported lower expenses, 29 per cent reported moderate expenses, and only 7 per cent reported a higher share of travel expenses in their total monthly income. Besides, of a small proportion of travellers who did not find the OLMT to be cheaper, 50 per cent of the commuters reported lower expenses, 35 per cent reported moderate expenses from their total monthly income, and 15 per cent reported a greater burden of travelling cost.

The main reason that the passengers considered the high travelling cost associated with the OLMT was the additional transportation required to connect to the OLMT stations. Of those commuters who faced higher expenses, 49 per cent of the passengers had to use rickshaws, 3 per cent used taxi services (TNCs, such as Uber/Careem, etc.) to reach their entry OLMT station, and 62 per cent had to use additional transport from their exit station to reach their desired destinations.

Likewise, 70 to 75 per cent of the OLMT users were those who required additional transport, such as rickshaws and taxis, both at the entry and exit OLMT stations. On the other hand, the OLMT ride was cheaper for those who did not require any additional transport, as the mass transit was within walking distance of their place of residence and commuters' destinations. Thus, the transport policy of Lahore needs to be made more compatible with mass transit by improving connectivity to induce more people by reducing the travel burden of additional travel costs attached to it. The provision of feeder buses would be more cost-effective in this regard in reducing the overall additional burden of travelling. Literature has also advocated running free-feeder lines as a 'first-generation subsidy' for improving connectivity, especially connecting poor neighbourhoods[10] (Mehndiratta, Rodríguez, & Ochoa, 2014; Harmony, 2018).

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[10]   Examples include Colombia and Brazil.ng technologies, such as electric cars and e-powered mass transit, to further reduce emissions.

Figure 13: Travel Experience (Users and Non-Users)

Independent-Samples Mann-Whitney U Test	
Outcome variable	p-value
Satisfaction with the Lahore transportation system	0.000
Travel restrictions	0.000
Adequacy of travel options in Lahore	0.000

Outer cricle (non-users); Inner circle (users)
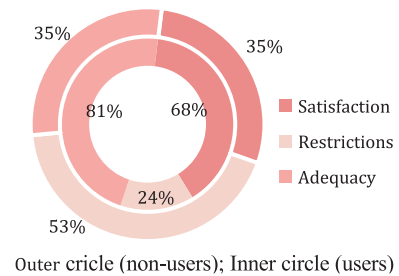
Note: The significance level is 0.05. The rank distribution is provided in Figure 15, Appendix C.
Source: OLMT Ridership Survey.

Significant p-values (Figure 13) indicate the rejection of the null hypothesis concluding that there was a significant difference between the users of the OLMT and non-users regarding their experience with the Lahore transportation system in terms of travel options, travel restrictions, and overall satisfaction. The users of OLMT were satisfied with the Lahore transportation system (68 per cent) and found the transport options adequate (81 per cent) compared to only 24 per cent who experienced discomfort and restrictions during travelling. On the other hand, a large proportion of non-users were dissatisfied due to inadequate travelling options and experienced travel restrictions and discomfort arising from traffic congestions and inability to reach destinations timely.

Regarding traffic congestion on roads, 59 per cent of the non-users faced frequent road congestion and 35 per cent faced congestion only occasionally. This shows that non-users of OLMT experienced immobility issues and inconvenience with the competing modes of travelling. Hence, it needs to be further explored as to why the non-users have not changed their travel behaviour and shifted to the OLMT. Further exploration revealed that the majority of non-users (68 per cent) were unaware and did not have complete information on the Lahore transportation network whereas 99 per cent of the OLMT users were confident about being well-equipped with travel information. Therefore, the information gap is also one of the reasons that have restricted the non-users substituting from their current travelling mode with OLMT despite facing discomfort and inconvenience. Therefore, overcoming this information asymmetry might increase the OLMT ridership and raise revenues.

The maximum willingness to pay for daily travelling was also captured for users and non-users. In both cases, the distribution was positively skewed since there is always an incentive to reveal less than the actual benefit attached to the consumption when the chances of benefiting from government subsidy are large. On average, the daily amounts that non-users and users were willing to spend were Rs. 28 and Rs. 146, respectively. However, the median values of willingness for the total sample, users, and non-users were Rs. 40, Rs. 100 and Rs. 20, respectively. The OLMT fare during the conduct of the field survey was Rs. 40 and when the passengers were presented with a hypothetical situation of a fare increase, 67 per cent of the users expressed their willingness to pay the increased fare (see Figure 7).

The significant p-values (Figure 14) indicate the rejection of the null hypothesis implying that daily travel expenses on public and private transport and travel burden relative to income were significantly different between the users of the OLMT and non-users. The users of the OLMT spent, on average, Rs. 138 and Rs. 356 daily

on public transport and private vehicles, respectively. The non-users, on the other hand, spent daily, on average, Rs. 91 and Rs. 141, respectively. Furthermore, the breakdown of travel burden shows that the percentage of users who had a smaller travel burden was greater compared. On the other hand, a greater proportion of the non-users had moderate to higher travel burden.

Figure 14: Travel Burden With Respect to Income (Users and Non-Users)

Independent-Samples Mann-Whitney U Test	
Outcome variable	p-value
Daily expenses using public transport	0.000
Daily expenses on a private vehicle	0.000
Travel burden on income	0.000
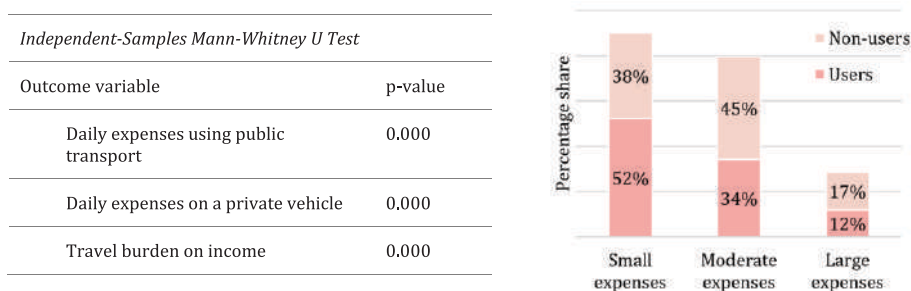
Note: The significance level is 0.05. The rank distribution is given in Figure 15, Appendix C.
Source: OLMT Ridership Survey.

The outcome of the study indicates that even though the users of OLMT experience more average daily costs as compared to non-users, users experienced a smaller travel burden relative to income when commuting via the OLMT. As explained earlier, the OLMT passengers faced additional travel costs due to the connectivity gap (see Figure 11), which made them spend an additional amount on top of the OLMT fare. Therefore, bridging the connectivity gap by providing feeder buses can play an important role in raising revenues by increasing OLMT ridership. The transportation network must be well integrated and feeder buses play an important role to supplement the rail mass transit system by improving the efficiency of the latter (Deng, Gao, Fu, and Zhou, 2013). Although, there will be again an issue of funding feeder buses as OLMT is already running losses and a heavy burden due to supply-side subsidisation. The solution is to focus on system-generated revenues by incentivising passenger use by providing connections via feeder buses. The feeder buses and the OLMT must be connected through a discounted smart card which will increase the overall demand for public transport services. Also, both these services must be run by a single service provider to make them more efficient, provided the feeder routes are free from contestability of potential entrants (minivans/rickshaws/ride-hailing services, such as Uber and Careem) through government regulations. Moreover, there was an almost equal proportion of users and non-users (64 and 66 per cent) who revealed demand for feeder buses for connecting the OLMT stations.[11]

The odds ratios were also calculated to predict the extent of the influence of expected change in travel time and absence or presence of connectivity with an OLMT station on the willingness to pay for feeder buses. The results are provided in Table 4. The commuters who expected an increase in travel time as opposed to no change had 66.4 per cent (1-0.336) less chance or had 0.336 times the odds of paying additional travel costs for feeder buses in

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[11] There has always been debate by policy analysts to make the cities more walkable, which is the most efficient solution. However, to make a city more walkable, the accessibility would greatly depend on the vertical growth of cities. However, urban sprawl with horizontal spread and city growth are the outcomes of urban town planning, which makes walkability less of a solution. Besides, when non-users were asked about why they do not travel via OLMT despite being at a walkable distance. The majority responded that they could more easily hail a rickshaw ride rather than walk to an OLMT station or use the stairways to board the train. Typically, the people are lethargic and less receptive to walkability; and the informal values are mainly responsible for such an attitude.

comparison to no payment. On the other hand, the odds of paying an additional amount for feeder buses were 12.19 times higher than no payment for commuters who expected a decrease in travel time with the use of feeder buses as opposed to no change in travel time. As for the observable connectivity gap, there were 60.3 per cent (1-0.397) and 58.9 per cent (1-0.411) fewer chances of paying additionally for feeder buses by those commuters who could either directly reach their destinations or walking without using additional transport as opposed to those who needed connecting transportation. Similarly, those who could directly walk or use a motorbike to reach the OLMT entry station had 60.3 per cent (1-0.397) and 50.5 per cent (1-0.495) fewer chances, respectively, to pay an additional fare for feeder buses in comparison to those who required taxi service (such as Uber, Careem, etc.) to reach the OLMT entry station. The results for car users, bus passengers, and rickshaws were insignificant.

Table 4: Odds Ratio of the Willingness to Pay for the OLMT Users for Additional Feeder Buses

Willingness to Pay Additional Fare for Feeder Buses (YES)[a]	B	Std. Error	Sig.	Exp(B)	Likelihood Ratio Test (Sig.)[e]
Expected Change in Travel Time[b]					0.000***
Increased Time	-1.091	0.170	0.000	0.336***	
Decreased Time	2.501	0.157	0.000	12.19***	
Connectivity Gap from OLMT exit Station to Destination[c]					0.000***
Directly Reach the Destination	-1.030	0.130	0.000	0.357***	
Walk to the Destination	-0.704	0.117	0.000	0.495***	
Connectivity Gap to Reach the OLMT Entry Station[d]					0.000***
Walk to the Entry Station	-0.923	0.441	0.036	0.397**	
Use of Motorbike	-0.889	0.447	0.047	0.411**	
Use of Car	-0.743	0.471	0.115	0.476	
Use of Bus	-0.532	0.499	0.286	0.587	
Use of Rickshaw	-0.352	0.442	0.424	0.702	
Model Fitting Likelihood Ratio Test (Sig.)	0.000***				
Pseudo R-square	0.386				
Source: Authors' calculations. *Number of observations: 4,900 OLMT users* *Method of estimation: Multinomial logistic regression.*					

*** and ** indicate 1% and 5% significance level.

a. Reference category: 'NO'. The third category is 'MAY BE' for which the results were insignificant and not reported in the table.

b. Reference category: No change in time

c. Reference category: Use of additional transport to reach destinations.

d. Reference category: Use of taxi service

e. Null hypothesis: all parameters of the effect are zero

Table 5 reports the odds ratios of the difference in demand for feeder buses between users and non-users of the OLMT. The results show that users of the OLMT had 0.368 times higher odds of fully supporting the feeder buses than non-users of the OLMT. Moreover, there was 84.1% less chance that users would reveal demand for feeder buses when compared with non-users. On the other hand, the odd ratio for demand for feeder buses was higher than the non-users of OLMT. The odds of fully or partially supporting the feeder buses by non-users were 2.717 times higher and 6.291 times higher, respectively, in comparison to the OLMT users compared to the odds of not supporting the provision of feeder buses. These results indicate that the provision of feeder services can induce the non-users to shift towards OLMT use, which can play an important role in increasing passenger ridership and generation of fair-return revenues.

Table 5: Odds Ratio of the Comparison Between Users and Non-Users of the OLMT For Additional Demand for Feeder Buses

Support for Government Policy to Improve Connectivity Via Feeder Buses[a]	B	Std. Error	Sig.	Exp(B)
Comparison of Users with Non-Users				
YES				
Users	-0.999	0.186	0.000	0.368***
MAY BE				
Users	-1.839	0.204	0.000	0.159***
Comparison of Non-Users with Users				
YES				
Non-Users	0.999	0.186	0.000	2.717***
MAY BE				
Non-Users	1.839	0.204	0.000	6.291***

Model-Fitting Likelihood Ratio Test (Significance)	0.000***
Pseudo R-square	0.046

Source: Authors' calculations.

Number of observations: 3,565 (3,065 users and 500 non-users)

Method of estimation: Multinomial logistic regression.

*** and ** indicate the significance level at 1% and 5%, respectively.

a. Reference category: 'NO'

Other than the feeder buses, another way to improve connectivity with the OLMT can be by introducing a digital app. The app can be developed for rickshaws along the lines of ride-hailing service apps of transport network companies (TNCs). The rickshaws used for the purpose may be named orange rickshaws. The app would contain information about routes, timings, and fares per kilometre from one OLMT station to another. Moreover, the app can be used to make additional travel cheaper and more affordable for users by pooling the riders heading in the same direction. This may further create a spillover benefit in terms of employment creation for those involved in providing the connectivity service, especially compensating the rickshaw drivers as the majority of the OLMT passengers' past mode of transport was rickshaw.[12]

6. CONCLUSION

The study undertook the ex-post evaluation of the Lahore Orange Line Metro Train – the first light rail mass transit service in Pakistan. The study explored the various aspects of the OLMT, such as accessibility, identified the gaps that discourage non-users, and proposed viable strategies for achieving financial sustainability. The study found considerable differences in daily travelling expenses of users and non-users of the OLMT using public and private transport. They incurred extra costs due to missing connectivity either from the OLMT exit stations to their destination or between their starting point to the OLMT entry station. Thus, even if these commuters pay a uniform fare of Rs. 40 per OLMT ride, the additional travelling adds to their costs. Even though users experience greater daily average travel costs as compared to the non-users, the users bear a lesser burden as compared to non-users in terms of the relative share of travel expenses in total income. Also, a substantial proportion of the users showed a positive attitude towards acceptance of a marginal increase in the OLMT fare of Rs. 10 followed by Rs. 20 and Rs. 30 fare increases.

The major reason for a higher average travelling cost for users is the connectivity with the mass transit service due to which the travellers require additional transport. Therefore, the provision of connectivity can greatly contribute to an increase in ridership and revenue generation. Similarly, missing connectivity is the reason for non-users not substituting their present mode with the OLMT. The non-users want to avoid the longer time it takes to reach the OLMT station first before being taken to their actual place of destination when they can take shortcuts by travelling directly to their destinations. However, these non-users experience discomfort and higher time costs by facing traffic congestion on roads. The traffic congestion, on the other hand, causes implicit delays for the non-users in comparison to the delays they think they will face connecting OLMT stations from their

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[12] Although environmentalists might show concern about the negative impact of the increased use of rickshaws on pollution, the survey of OLMT users has shown that many passengers who were previously commuting via rickshaws have shifted towards the OLMT. Moreover, the survey of non-user also revealed that there is a considerable number of people who still commute via rickshaw through shared fare. Therefore, policymakers can achieve allocative efficiency by formally bringing the rickshaw service providers into the connectivity net.

departure points. Another reason that discourages them to use the OLMT is the information gap regarding the routes, timings, nearest OLMT stations, and the use of the OLMT.

7. RECOMMENDATIONS AND FUTURE DIRECTIONS

The current study has some useful policy implications to devise strategies compatible with the OLMT mass transit service. One of the important policy implications is to increase transit coverage and catchment area through connectivity. The future direction for policymakers is to survey to develop an optimal design of the feeder-bus network system to improve connectivity with OLMT. Furthermore, a mobile app needs to be devised that contains information on the OLMT service and connectivity routes to overcome the information gap. The mobile App can also be used for the provision of TNC-type services to improve connectivity. Such measures can induce more people to shift towards OLMT and prevent the present users to discontinue by making the additional travel expenses lower and more affordable as compared to prevailing multimodal arrangements of connectivity.

On the other hand, the burden of government subsidies can be reduced by replacing the uniform user charges with specially targeted smartcards for regular users by grouping them into different income profiles and as per the requirements of the working class, students, and females. In addition, the zoning of ridership fare between peak and off-peak hours and the coverage of distance along the OLMT route is another way of generating additional revenue streams.

Lastly, the burden of government subsidy can also be eased through alternative sources of revenues other than targeting the ridership only. The public-private partnerships (3Ps) can play an important role in this regard by promoting commercial activities on the OLMT. The OLMT stations are economically valuable for small businesses (such as food kiosks by selling on-the-go snacks) and revenue sharing can be a source of additional finance for the mass transit. The mass transit rail can also be used as an advertisement and marketing medium to generate additional revenue streams. The most immediate intervention is to use the train's display screens for advertisement purposes. This can generate a considerable amount of non-commuter revenue source for the OLMT service. Similarly, digital screens can also be installed at each OLMT station, which can not only save the stations' running electricity costs but provide revenue through the provision of a platform for advertisements. Static ads can also be a source of additional revenue for this mass transit. Conversely, rather than just focusing on mobility in isolation, there is a need to follow the global practice of collaboration. The MTR services in Shanghai and Tokyo have shifted the fare-setting strategy from affordability to service quality. In Hong Kong and Singapore, the provision of MTR is through private partnership and a land development scheme is adopted to benefit from increased land value to recover the costs.

As for the feasibility of purple and blue lines, it must be kept in mind that introducing a mass transit service without the support of a well-connected network and awareness, welfare gains cannot be maximised. The accessibility-by-destinations is also a necessary element for chalking out the routes for a mass transit service, i.e., the location of employment and access to health and education institutions need to be considered for realising the full benefits of a transit service. These factors must be given considerable weight while devising the feasibility study for the purple line/blue line or replication of similar mass transit in other locations or cities since transportation demand is a derived demand and ridership of mass transit cannot be increased without access to destinations. Moreover, such service provision is not financially viable in the long run if supported by government subsidies. Being a developing country and facing huge fiscal constraints, it will never be feasible for Pakistan to introduce such public transport interventions solely based on government support. Pakistan needs to follow in the footsteps of Singapore, China (Shanghai), Japan (Tokyo), and Hong Kong where the mass transits are commercially operated rather than depending solely on fare or transferring the burden on government resources. Therefore, public-private partnership is necessary for generating additional revenue streams or further advancement in rail mass transit systems in Pakistan.

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APPENDIX A

Questionnaire For OLMT Users

1	Day: 1. Monday 2. Tuesday 3. Wednesday 4. Thursday 5. Friday 6. Saturday 7. Sunday

2	Date:	Month:

3	Time: 1. Morning 2. Afternoon 3. Evening (07:00-12:00 pm) (12:00 pm to 05:00 pm) (5:00 pm to 10:00 pm)

4	**OLMT ENTRY Station** 1. Ali Town 2. Thokar Niaz Bai 3. Canal View 4. Hanjarwal 5. Wahdat Road 6. Awan Town 7. Sabzazar 8. Shahnoor 9. Salahudin Road 10. Bund Road 11. Samanabad 12. Gulshan-e-Rav 13. Chauburgi 14. Lake Rd/Anark 15. GPO 16. Lakshmi Chowk 17. Railway Statio 18. Sultanpura 19. UET 20. Baghbanpura 21. Shalamar Garde 22. Pakistan Mint 23. Mahmood Booti 24. Salamat pura 25. Islam Park 26. Dera Gujran

5	**OLMT EXIT Station** 1. Ali Town 2. Thokar Niaz Baig 3. Canal View 4. Hanjarwal 5. Wahdat Road 6. Awan Town 7. Sabzazar 8. Shahnoor 9. Salahudin Road 10.Bund Road 11. Samanabad 12. Gulshan-e-Ravi 13. Chauburji 14. 15.GPO

Lake Rd/Anarkali

	16.Lakshmi Chowk 17.Railway Station 18. Sultanpura 19. UET 20. Baghbanpura 21. Shalamar Garden 22. Pakistan Mint 23. Mahmood Booti 24. Salamat pura 25. Islam Park 26. Dera Gujran
6	Respondent Age: …………………….
7	Residential area: ……………………..
8	No. of dependents in household: ……………………..
9	No. of income earners in household: ……………………..
10	Gender: 1. Male 2. Female 3. Transgender
11	Employment Status and Occupation 1. Employed 2. Self Employed 3. Unemployed 4. Student
12	If employed/self-employed then write the occupation ……………………………………………
13	Are you a person with a disability? 1. Yes 2. No

14	What is your education?
	
	  1. Uneducated 2. Primary 3. Secondary 4. Matric
	
	  5. Intermediate 6. Undergraduate 7. Post-Graduate 8. Diploma

15	What is your monthly income?

	1. Below 20,000 Rs 2. 20,000 Rs - 29,999 Rs 3. 30,000 Rs - 39,999 Rs 4. 40,000 Rs - 49,999 Rs 5. 50,000 Rs - 59,999 Rs 6. Above 60,000 Rs
16	How many years you have lived in Lahore? 1. Less than 1 year 2. 1- 5 years 3. 6 - 10 years 4. 11 - 15 years 5. 16 - 20 years 6. 21 - 25 years 7. 26 - 30 years 8. More than 30 years 9. Always
17	Select your age group 1. 20 years and less 2. 21 -30 years 3. 31-40 years 4. 41-50 years 5. 51-60 years 6. 61 years and above
18	The approximate number of motorised trips you take in one day (Total including all transportation modes and destinations): ……………………………………………………………………………
19	The approximate expense of travelling per day (if public transport is taken): ………………………………. Rs
20	The approximate expense of travelling per day (if private transport is taken): ……………………………… Rs
21	Approximately how much of your income is spent on monthly travelling? 1. No expenses 2. Small expenses 3. Moderate expenses 4. Large expenses
22	Are you satisfied with the transportation system of Lahore?

	1. Yes 2. No 3. To some extent
23	Does the Lahore transportation system restrict your life? (e.g., traffic congestion, discomfort, time cost, inability to reach destinations etc) 1. Yes 2. No 3. Sometimes
24	Are transport options in Lahore adequate? (i.e., you have easy access to reach your destinations) 1. Yes 2. No 3. To some extent
25	How often do you use public transport against personal transport in a week? 1. (1) 2. (2) 3. (3) 4. (4) 5. (5) 6. (6) times or more 7. never
26	How often do you use the OLMT in a day? 1. (1) 2. (2) 3. (3) 4. (4) 5. More than 4 (Other)……………
27	How many days a week do you use the OLMT? 1. (1) 2. (2) 3. (3) 4. (4) 5. (5) 6. (6) 7. (7)
28	Since how long you have been using the OLMT? 1. Since opening 2. More than 6 months 3. 4 to 6 months 4. 2 to 3 months 5. Less than 1 month
29	Do you use the OLMT to reach the following destinations? 1. Workplace/Office 2. School/College 3. Both 4. None

23	Does the Lahore transportation system restrict your life? (e.g., traffic congestion, discomfort, time cost, inability to reach destinations etc) 1. Yes 2. No 3. Sometimes
24	Are transport options in Lahore adequate? (i.e., you have easy access to reach your destinations) 1. Yes 2. No 3. To some extent
25	How often do you use public transport against personal transport in a week? 1. (1) 2. (2) 3. (3) 4. (4) 5. (5) 6. (6) times or more 7. never
26	How often do you use the OLMT in a day? 1. (1) 2. (2) 3. (3) 4. (4) 5. More than 4 (Other)................
27	How many days a week do you use the OLMT? 1. (1) 2. (2) 3. (3) 4. (4) 5. (5) 6. (6) 7. (7)
28	Since how long you have been using the OLMT? 1. Since opening 2. More than 6 months 3. 4 to 6 months 4. 2 to 3 months 5. Less than 1 month
29	Do you use the OLMT to reach the following destinations? 1. Workplace/Office 2. School/College 3. Both 4. None
30	Do you use OLMT to reach local services (hospitals/community/library, etc)? 1. Always 2. Occasionally 3. Never

31	Do you use OLMT for the following activities? 1. Shopping 2. Recreational activities (parks/family 3. Both 4. none visits, etc.)
32	Do you own a personal vehicle? 1. No vehicle 2. Cycle 3. Bike 4. Car
33	Does your household own a vehicle? 1. No vehicle 2. Cycle 3. Bike 4. Car
34	Would you prefer (or wish to prefer) your personal vehicle over the OLMT for convenience? 1. Yes 2. No 3. May be
35	Would you prefer (or wish to prefer) your personal vehicle over the OLMT due to affordability? 1. Yes 2. No 3. May be
36	What was your alternative mode of travelling before the OLMT? 1. Personal 2. Public Bus/Van/Metro 3. Private Taxi/Uber/Careem/Sw 4. Rickshaw 5. Carpool/Lift
37	How do you reach the OLMT? 1. By walking 2. By bicycle/motorbike 3. By car 4. By bus/van 5. By rickshaw 6. By taxi

38	Do you directly reach your destination from the OLMT station?
	1. Yes 2. No, but can walk to my destination 3. No, and use additional transport to reach the destination
39	Is a bike stand/parking lot available near your OLMT Station?
	1. No 2. Bike stand (Yes 3. Parking lot (Yes 4. Both (Yes) 5.Both (Limited
40	How much time does it take to reach the OLMT station?
	1. Less than 5 minutes 2. 5-10 minutes 3. 10-15 minutes
	4. 15-20 minutes 5. More than 20 minutes 6. Other ....
41	Distance of the OLMT station from your home:
	1. 0.5 km 2. 1 km 3. 1.5 km 4. 2 Km 5. More than 2km
42	Distance of the OLMT station from your destination:
	1. 0.5 km 2. 1 km 3. 1.5 km 4. 2 Km 5. More than 2km
43	I will support the policy if the government provides feeder buses (connectivity) to my OLMT stations
	1. Yes 2. No 3. May be 4. Connectivity is availabl
44	How much will be the increase in your travelling cost if feeder buses are provided to connect with OLMT stations?
	1. Less than the alternative mode of travelling 2. Greater than the alternative mode of travelling

45	Do you think the provision of feeder buses will increase/or decrease your travelling time as compared to the alternative mode of travelling? 1. Increase time 2. Decrease time 3. No change
46	I am willing to pay the additional cost of feeder buses to connect to the OLMT station if provided: 1. Yes 2. No 3. May be
47	If a public service for pick-and-drop is provided to commute between your residence and destination, how much the highest you would pay? ……………………………
48	Has the OLMT reduced your travelling distance? **1.** No change **2.** Reduced Slightly **3.** Reduced Largely **4.** Increased **5.** Don't know
49	Has the OLMT reduced your travelling time? 1. No change 2. Reduced Slightly 3. Reduced Largely 4. Increased 5. Don't know
50	Has the OLMT reduced your travelling cost? 1. No change 2. Reduced Slightly 3. Reduced Largely 4. Increased 5. Don't know
51	Is the OLMT cheaper than other transport modes? 1. Yes 2. No 3. Sometimes 4. Don't know

52	What was your daily cost of travelling before using the OLMT? 1. Rs. 40 or less 2. Rs. 40 – 70 3. Rs. 70 – 100 4. Rs. 100 – 150 5. Rs. 150 – 200 6. Above Rs. 200
53	Will you use the OLMT if fare/ ticket charges are increased slightly? 1. yes 2. no If yes, why? ....
54	Is it comfortable to use the OMLT compared to alternatives? 1. Yes 2. No
55	Before using the OLMT you had to face large traffic congestion on roads? 1. Always 2. Sometimes 3. No
56	Is the OLMT a safer means of travelling as compared to alternative modes? 1. Yes 2. No 3. To some extent
57	The travel information (time/routes/fee/ticketing, etc.) available is easy to understand 1. Yes 2. No 3. No, and should be available.
58	Is it easy to get to the places using the OLMT? 1. Always 2. Sometimes 3. No

59	Do you prefer using the OLMT over other modes of public transport? 1. Yes 2. No 3. Indifferent
60	Do your friends/family use the OLMT? 1. Yes 2. No 3. don't know If yes/no, provide reason: …………………………………………………
61	Your companion passengers on the OLMT are of the same socioeconomic status as yours? 1. Always 2. Sometimes 3. No
62	Your companion passengers on OLMT belong to which socioeconomic status? 1. Mostly lower income status 2. Mostly middle-income status 3. Mostly high-income status
63	What change has occurred in your socio-economic status after travelling by the OLMT? 1. No change 2. Improved 3. Deprived
64	Will you continue to use the OLMT in future? 1. May be 2. Yes 3. No
65	Will you continue to use the OLMT in future if the fare increases by Rs. 10? 1. May be 2. Yes 3. No

66	Will you continue to use the OLMT in future if the fare increases by Rs. 20? 1. May be 2. Yes 3. No
67	Will you continue to use the OLMT in future if the fare increases by Rs. 30? 1. May be 2. Yes 3. No
68	Would you recommend others to use the OLMT? 1. May be 2. Yes 3. No
69	Do you think that the OLMT will play an important role in reducing urban congestion on roads in future? 1. May be 2. Yes 3. No

APPENDIX B

Questionnaire for Public Transport Passengers but Non-Users/Ex-Users of the OLMT

1	**What is your current mode of travelling?** 1. Ca 2. Motorbike 3. Van 4. Rickshaw 5. Both car and bike 6. Van and rickshaw 7. All of the above
2	**Which OLMT station is nearest to your residence?** 1. Ali Town 2. Thokar Niaz Bai 3. Canal View 4. Hanjarwal 5. Wahdat Road 6. Awan Town 7. Sabzazar 8. Shahnoor 9. Salahudin Road 10. Bund Road 11. Samanaba 12. Gulshan-e-Ravi 13. Chauburji 14. Lake Rd/Anarkali 15. GPO 16. Lakshmi C 17. Railway Station 18. Sultanpura 19. UET 20. Baghbanpura 21. Shalamar Garden 22. Pakistan Mint 23. Mahmood Booti 24. Salamat pura 25. Islam Park 26. Dera Gujran
3	Mention Distance 1. 0.5 km 2. 1 km 3. 1.5 km 4. 2 Km 5. More than 2km
4	**Which OLMT station is nearest to your destination?** 1. Ali Town 2. Thokar Niaz Bai 3. Canal View 4. Hanjarwal 5. Wahdat Road 6. Awan Town 7. Sabzazar 8. Shahnoor 9. Salahudin Road 10. Bund Road 11. Samanabad 12. Gulshan-e-Ravi 13. Chauburji 14.Lake Rd/Anarkal 15.GPO

	16.Lakshmi Chowk 17. Railway Station 18. Sultanpura 19. UET 20. Baghbanpura 21. Shalamar Ga 22. Pakistan Mint 23. Mahmood Booti 24. Salamat pura 25. Islam Park 26. Dera Gujran
5	Mention Distance
	1. 0.5 km 2. 1 km 3. 1.5 km 4. 2 Km 5. More than 2km
6	Respondent Age:
7	Residential area:
8	No. of dependents in household:
9	No. of income earners in household:
10	Gender: 1. Male 2. Female 3. Transgender
11	Employment Status and Occupation 1. Employed 2. Self Employed 3. Unemployed 4. Student
12	If employed/self-employed then write the occupation ……………………………………………
13	Are you a person with a disability? 1. Yes 2. No
14	What is your education? 1. Uneducated 2. Primary 3. Secondary 4. Matric 5. Intermedia 6. Undergraduate 7. Post-graduate 8. Diploma

17	Select your age group
	1. 20 years and less 2. 21 -30 years 1. 31-40 years 2. 41-50 years 3. 51-60 years 4. 61 years and above
18	The approximate number of motorised trips you take in one day (Total including all transportation modes and destinations): _____
19	The approximate expense of travelling per day (if public transport is taken): ……………………………… Rs
20	The approximate expense of travelling per day (if private transport is taken): …………………………… Rs
21	Approximately how much of your income is spent on monthly travelling? 1. No expenses 2. Small expenses 3. Moderate expenses 4. Large expenses
22	Are you satisfied with the transportation system of Lahore? 1. Yes 2. No 3. To some extent
23	Does the Lahore transportation system restrict your life? (e.g. traffic congestion, discomfort, time cost, inability to reach destinations etc) 1. Yes 2. No 3. Sometimes
24	Are transport options in Lahore adequate? (i.e., you have easy access to reach your destinations) 1. Yes 2. No 3. To some extent
25	How often do you use public transport against personal transport in a week? 1. 2. (2) 3. (3) 4. (4) 5. (5) 6. (6) times or more 7. Never

26	Have you travelled by the Lahore OLMT?
	
	    1. Yes 2. No
	
	If yes, what was the purpose of using the OLMT?
	
	26a) To reach: 1. Workplace/Office 2. School/College 3. Both 4. None
	
	26b) To reach: 1. Community service 2. Shopping 3. Recreation
	                                 1. All of the above 5. None
	
	If yes, what was your experience with using the OLMT?
	
	26c) Time-consuming: 1. Yes 2. No
	
	26d) Costly: 1. Yes 2. No
	
	26e) Is the OLMT station near your residence? 1. Yes 2. No
	
	26f) Is the OLMT station near your destination? 1. Yes 2. No
	
	26g) It is not convenient to reach OLMT station 1. Yes 2. No

	If no, why you do not use the OLMT frequently? 26h) Time-consuming: 1. Yes 2. No 26i) Costly: 1. Yes 2. No 26j) Is the OLMT station near your residence? 1. Yes 2. No 26k) Is the OLMT station near your destination? 1. Yes 2. No 26l) It is not convenient to reach the OLMT station 1. Yes 2. No
27	Do you own a personal vehicle? 1. No vehicle 2. Bicycle 3. Motorbik 4. Car
28	Does your household own a vehicle? 1. No vehicle 2. Cycle 3. Motorbik 4. Car

29	Do you directly reach your destination using the current transport mode? 1. Yes 2. No, but can walk to my destination 3. No, and use additional transport to reach the destination
30	How much time does it take to wait or access this current mode of public transport? 1. Less than 5 mi 2. 5-10 minutes 3. 10-15 minutes 4. 15-20 minutes 5. More than 20 minutes
31	Distance of your current public transport from your home 1. 0. 2. 1 km 3. 1.5 km 4. 2 Km 5. More than 2km
32	Distance of your current public transport from destination 1. 0. 2. 1 km 3. 1.5 km 4. 2 Km 5. More than 2km
33	I will support the policy if the government provides feeder buses (connectivity) to OLMT Stations from home/destinations 1. Ye 2. No 3. May be 4. Connectivity is available
34	How much will be the increase in your travelling cost if feeder buses are provided to connect with OLMT stations? 1. Less than the alternative mode of travelling 2. Greater than the alternative mode of travelling
35	Do you think the provision of feeder buses will increase or decrease your travelling time as compared to alternative modes of travelling? 1. Increase time 2. Decrease time 3. No change

36	I am willing to pay the additional cost of feeder buses to connect to the OLMT station if provided 1. Yes 2. No 3. May be
37	If a public service for pick-and-drop is provided to commute between your residence and destination, what is the highest amount you are willing to pay? ....
38	What is your daily cost of travelling? 1. Rs. 40 or less 2. Rs. 40 - 70 3. Rs. 70 - 100 4. Rs. 100 – 150 5. Rs. 150 - 200 6. Above Rs. 200
39	Is it comfortable to use the current public transport mode as compared to the OLMT? 1. 2. No 3. No difference
40	Do you face large traffic congestion on roads? 1. Always 2. Sometimes 3. No
41	Is your current transport mode a safer means of travel? 1. Yes 2. No 3. To some extent
42	Do you have awareness and complete information about the Lahore transport network? 1. Yes 2. No 3. No, and should be available.
43	Is it easy to get to the places by using public transport in Lahore? 1. Always 2. Sometimes 3. No

|	
44	Do you prefer using the current public transport over the OLMT? 1. Yes 2. No 3. Indifferent Provide reason…………………………………………………..
45	Do your friends/family use OLMT? 1. Yes 2. No 3. don't know If yes/no, provide reason: ……………………………………………………
46	Do you think that OLMT will play an important role in reducing urban congestion on roads in future? 1. May be 2. Yes 3. No

Appendix C

SUPPLEMENTARY TABLES

Table 6: Shapiro-Wilk Normality Test

| Variable	Total Sample	User	Non-user
Daily Travel Expenses Using Public Transport	(0.000)	(0.000)	(0.000)
Daily Travel Expenses Using Private Transport	(0.000)	(0.000)	(0.000)
Willingness to Pay for Public Service Pick and Drop Service	(0.000)	(0.000)	(0.000)

Note: The significant p-values provided in parentheses indicate the rejection of the null hypothesis of normal distribution

Figure 15: Independent Mann-Whitney Test
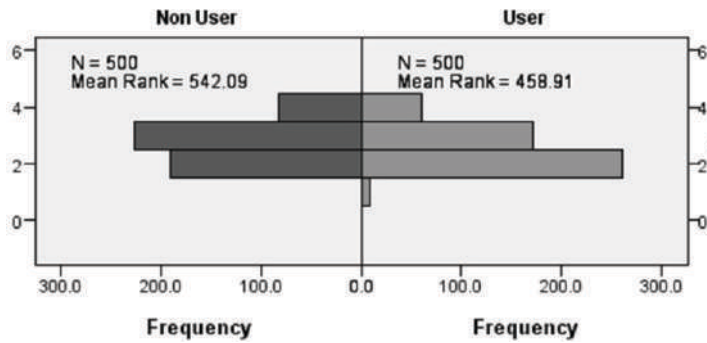
a)   Rank Distribution for Daily Travel Expenses Using Public Transport
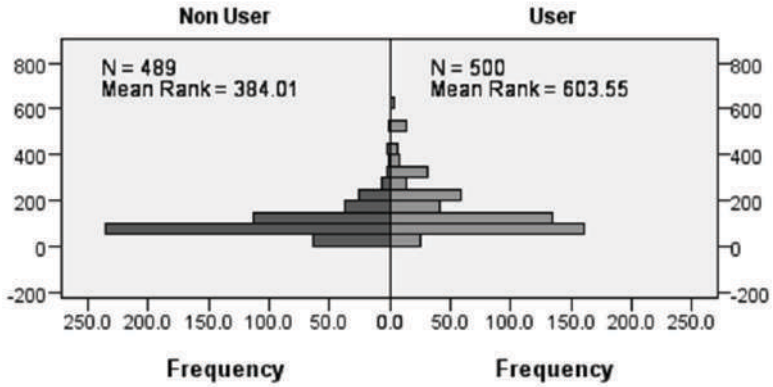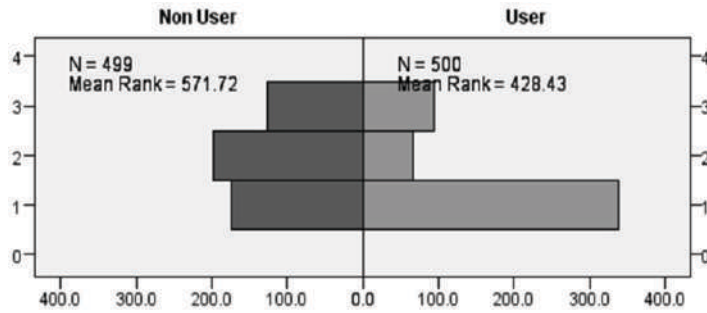

b) Rank Distribution for Daily Travel Expenses Using Private Transport
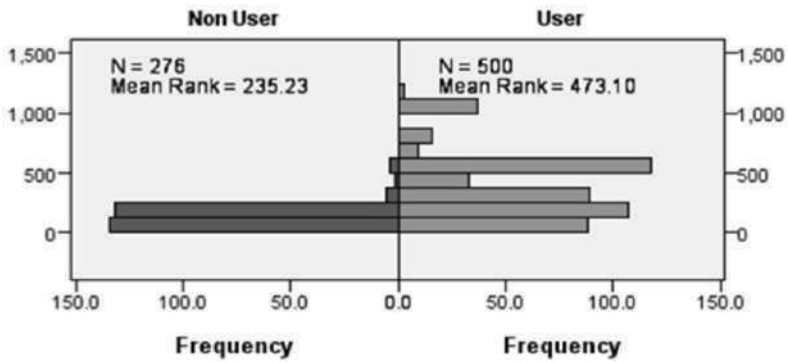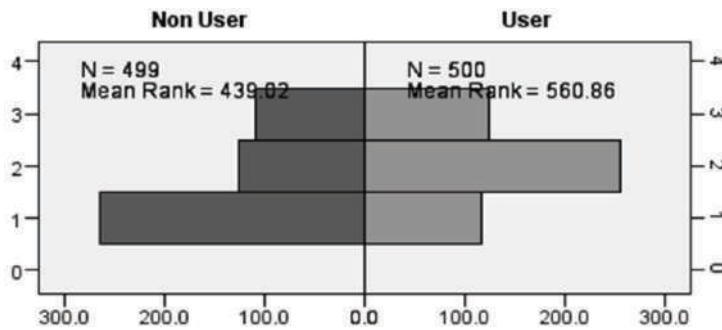

c)   Independent Mann-Whitney Test: Rank Distribution for Daily Travel Burden
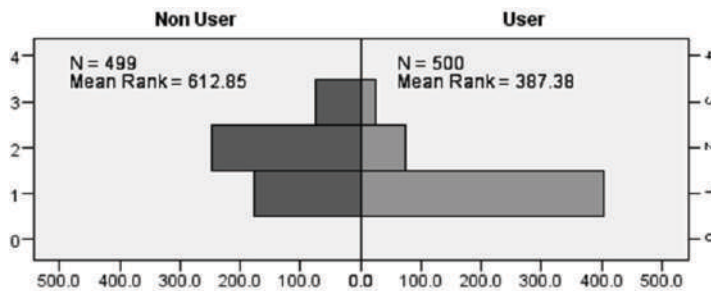
d)   Rank Distribution for Satisfaction from Lahore Transportation System

e)   Rank Distribution Regarding Travel Restriction and Discomfort

f)   Rank Distribution Regarding Adequacy of Transport Options

PART II
PUBLIC SERVICE DELIVERY
Policy Briefs

ANALYSING THE IMPACTS OF DECENTRALISATION IN IMPROVING HEALTH SERVICES IN BALOCHISTAN: A DECISION SPACE, INSTITUTIONAL CAPACITY, AND ACCOUNTABILITY APPROACH

Manzoor Ahmed

INTRODUCTION

A central aim of decentralisation is to bring services closer to local people. Decentralisation is preferred over central service delivery when societies are heterogeneous and when there are no spillovers from one region to another. However, this argument may not be appropriate for developing countries in which the mechanisms of political accountability are not well developed, where corruption is prevalent, and there is elite capture. In such cases, decentralisation may lead to worse outcomes compared to a centralised system. For example, fiscal resources disbursed to the local/ subnational governments from the central government may be syphoned off to luxury consumption by the local elite.

For these reasons, it is argued that decentralisation should be accompanied by measures that strengthen local accountability, minimise the risk of corruption, improve the transparency of regional governments, and ensure that local people participate in service delivery. However, decentralisation can be risky as decentralised units do not necessarily have the capacity and incentives to act. Several conditions should be met before decentralisation can fully result in better provision and quality of health services at the local level.

In Pakistan, decentralisation, both fiscal and administrative, was pursued through the 7th NFC award and the 18th Amendment in 2009 and 2010, respectively. A key reason for adopting (fiscal) decentralisation was to empower provincial governments to provide better health and other services.

The impact of decentralisation on the health sector largely depends upon the institutional capacity and individuals' performance. In terms of health services provision, a suitable institutional and individual capacity to exercise a given decision space is crucial for the health sector's performance. Another equally important condition for improving health service delivery is the accountability dimension.

METHODOLOGY

Based on Framework Method and Decision Space Model, the paper on which this policy brief is based, examined the decision-making process of the health officials and representatives at the provincial and district levels in Balochistan to implement health policies and provide health services, their level of "capacity," and the mechanism of accountability of the officials and representation for the health services delivery. The decision space was combined with the two other dimensions of accountability and capacity to argue that the complementary interactions or synergy of all three dimensions will lead to improved health outcomes after decentralisation in Balochistan.

Four districts from three divisions of Balochistan were selected and respondents included three secretaries and two politicians. The remaining respondents were professional civil service health officials. The selection of participants was purposive, which to exploit the variation in the profiles of the respondents in terms of current roles and overall affiliations with the organisation, degree of decision-making, and geographic locations where they were staffed or working.

FINDINGS

In the planning function, there is a "narrow" decision space that the health officials at districts can exercise and a "narrow-to-moderate" decision space for health officials and politicians at the level. Decision-making in planning can be enhanced when planners and decision-makers not only have sufficient capacity for strategic planning and engaging numerous stakeholders in the planning procedure but also have a sound accountability mechanism to develop good decision-making and planning at all levels as well as stridently monitor the implementation of these plans to guarantee the satisfactory provision of health services.

In the financing and budget allocation function, there is "moderate" to "narrow" space at the district level and "moderate" at the provincial level as in financing and budgeting decisions in Balochistan primarily rest with the provincial government, particularly the politicians, who hardly take any suggestion from the health officials and the civil services dealing in the health and P&D departments. There is a high degree of "centralisation" at the provincial level in budgeting and financing, the health sector at the district level relies significantly on payments from the provincial government.

The health services delivery is "narrow" since the health officials at the district level do not have the required scope to implement health programmes and provide routine (both primary and tertiary health) services. District health officers and the PPHI have no authority to promulgate health programmes and provide services apart from the ones mandated by the provincial government. Health services provision in Balochistan is marked with weak governance and insufficient capacity at the district level and beyond where the primary health services are provided, resulting in weak service delivery and programme implementation. This includes the immunisation coverage of children, prenatal care for women, etc.

Decision space for the overall management and availability of equipment and medicines is assessed as "narrow". Although the district-level officials already have a full mandate and management control over health facilities and equipment, there is a sheer lack of availability of facilities and equipment at the local

level, which include vaccines, medicines, contraceptives, machinery laboratory diagnostic kits, labour rooms, operation theatres, etc. Decision space for such functions in the healthcare sector can be improved if the decision-makers and health officials at the district or local level are better equipped with the required management skills and sufficient capacity for running health facilities and programmes. The district/local government health officials and staff members do not possess this capacity.

Similarly, health officials and workforce management space is "narrow". Formally, the health department enjoys full control over the management of its health officials and workforce at both provincial and district levels. The district-level officials are unable to hire the minimum number of health officials and workers they need due to a lack of mandate and their lack of resources to pay for their wages or the absence of facilities and incentives for health workers to serve in these far-flung areas. The required mandate and capacities for local-level health officials may include having suitable financial resources to hire workers and the quantity of health workers which the local people then require, and to offer adequate salaries and benefits.

The decision space for data monitoring and utilisation is "narrow," as the health set-up at the district or local level is not primarily responsible for collecting health-related data at local levels and transmitting the same to the provincial government for consolidation and further consumption and assessment. In Balochistan, even the decision-makers at the provincial level perform data collection in a customary fashion and out of mere compliance. The department at the provincial level lacks capacities to utilise the data to initiate meaningful actions for better healthcare services.

The findings suggest numerous opportunities for increasing the institutional capacities not only at the district/local level but also at the provincial level. Moreover, there is an opportunity for strengthening the accountability mechanisms to encourage good decision-making after decentralisation. A wide decision space at the district level is not enough to improve and expand health services delivery if it is not accompanied by building the capacity of health

officials, and also ensuring their accountability to the community, politicians and overall system of governance for all relevant decisions they make.

Decentralisation in Balochistan may not have been effective in health service delivery, and other services as well, as the existing power structures persist in the province with rent-seeking tendencies. With weak institutional structure, decentralisation furthers or sustains corruption compounded by a lack of accountability measures as politicians become the centre of decision-making, and sustain and even promote.

POLICY RECOMMENDATIONS

The insights from Balochistan suggest that we should move just beyond linear causation and to a more complexity-informed approach to make decentralisation more effective for health services delivery. The solution to the challenges in the health sector in Balochistan does not come from either more centralisation or more decentralisation or federalism to local governments per se. It, instead, potentially comes from concentrating on enhancing institutional capacity and accountability regardless of the governance structure.

To optimise decentralisation in the health sector in Balochistan, better decision space at district levels is indeed required, but this needs to be accompanied by an expanded capacity and strong accountability. It is important that in all tiers of government for implementing decentralisation, there is a concerted effort to encourage greater knowledge of the de jure decision space and push all health officials to take responsibility for making decisions aiming for better performance of health services. Efforts should also be made to develop synergistic effects by developing institutional capacity, focusing first on the district administrative units facing the least institutional capacity. Such interventions for local capacity building should be a component of all health-related programmes. Similarly, accountability to elected representatives and the governance system as a whole should be exercised at a higher bureaucratic level. If the accountability mechanism at the local

level is a policy objective, then more effort in decentralised contexts may be needed to encourage local decision-making with balanced configurations of the decision space with the dimensions of institutional capacity and robust accountability mechanism.

The capacity for the health officials at the local level to engage the private sector also needs to be enhanced and expanded so that some aspects of service delivery can be made more efficient through public-private partnerships as in the majority of districts in Balochistan the private sector health structure is functional. Areas for such a partnership include outsourcing the provision and maintenance of expensive equipment required by the provincial hospitals.

The officials may also enhance their decision space for such functions when their capacities in understanding health-related issues and provision of public health are increased. They should understand what certain crucial health indicators mean and how they can be interpreted and translated, how how these data that can guide effective decision-making. Decision-making in financing and budgeting may then be enhanced when local decision-makers have a suitable degree of capacities for performing priority-setting, including an emphasis on primary and preventive care services, and evidence-informed instead of politically-motivated funding decisions at the provincial and district level. The accountability mechanisms for such functions may include the health department at the provincial level deploying its data collectors at the local level validating the data being reported through experts, and also to accelerate the transmission of the data to the federal level for national and international use. Furthermore, the Federal government of Pakistan may consider frequently publicising the provincial governments in terms of meeting selected targets of health outcomes to inform the population of the performance of the provincial governments. Similarly, it may maintain a reliable electronic database that pools all health-relevant indicators from district and local levels, which is essential for accurately assessing the state of health as a whole.

THE POLITICAL ECONOMY OF SCHOOL EDUCATION IN THE POST-18TH AMENDMENT BALOCHISTAN

Rafiullah Kakar, Muhammad Saleem and Bilal Sarwar

INTRODUCTION

The adoption of the 18th Amendment to the Constitution of Pakistan in 2010 is arguably the most important political development in the recent history of the country. The 18th Amendment devolved many important subjects to the provinces through the abolition of the concurrent list. All key subjects related to school education came under the exclusive legislative and executive jurisdiction of the provinces. In the wake of the adoption of the 18th Amendment, nearly all provincial governments have introduced reforms in education management including enhanced financing for education but have produced mediocre results at best.

The study on which this policy brief is based reviewed and examined school education management and financing trends in the post-devolution Balochistan and employed a political economy approach to understanding why increased financing and improved management framework are not translating into commensurate improvements in education outcomes, notably access and learning outcomes.

THEORETICAL FRAMEWORK & METHODOLOGY

The recent scholarship, led by political economists, recognises that the roots of the educational crisis lie in both technical and political factors. In this vein, an increasingly influential approach is the analytical framework of political settlements. The study was based on this political economy approach.

The study followed a qualitative research methodology. Given the complex and multi-dimensional nature of education service delivery, the single case study design was adopted.: Primary data was collected through face-to-face, semi-structured key informant interviews (KIIs) and focus group discussions (FGDs). Secondary data were collected from official sources, budget figures, sector plans, and reports of the Secondary Education Department and other relevant departments of the Government of Balochistan. The data were analysed using descriptive statistics and thematic analysis.

FINDINGS

In the post-18th Amendment period, the Government of Balochistan (GoB) introduced several legal, institutional, governance, and management framework reforms related to school education. These reforms were supplemented by increased budgetary allocations for education. For example, the average share of education in the overall provincial budget averaged 18.24 per cent during 2013-2021 compared to 14.57 per cent share between 2007 and 2012.[1] This level of spending on education is not far from the global financing benchmarks set for education by the international community for achieving Sustainable Development Goal 4.

The increased public spending on education has improved the availability of a few basic schooling inputs. Similarly, reforms in education management

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[1] 2012 has been chosen as the cut-off year as the first general elections under the post-devolution governance structure were conducted in 2013. Besides, data is not available for the pre-2007 period.

have improved strategic planning (de-jure) and the availability of data to monitor a select number of inputs. However, limited gains have been recorded in reading and arithmetic skills at the primary and middle levels in the post-devolution period. The most important access indicator is the proportion of out-of-school children, which has not recorded any meaningful reduction post-devolution. Furthermore, most indicators related to access, learning, and equity have remained stagnant, while a few outcome indicators have even recorded a marginal decline.

There are two major explanations for the slow progress of education outcomes in Balochistan. Firstly, learning is not the objective of education policy and practice. Secondly, the expansion of schooling appears to have remained a strategic priority of education policy and practice but it has not experienced significant improvement because serious policy incoherence exists in various elements of the education system.

The analysis further reveals that the political settlement in the province is fragile and predatory characterised by a high degree of political exclusion, fragmentation, competitive clientelism, and personalised institutions. The political settlement lens reveals that elite interest in Balochistan is aligned neither to improve learning nor schooling. Instead, it is aligned strongly with the provision of targeted benefits to patronage networks. The resultant poor quality of education has pushed and encouraged the relatively educated and well-off classes to opt out of public schooling. The result is that there is a lack of an organised and powerful constituency to exert pressure on the education system at the local and provincial levels.

POLICY RECOMMENDATIONS

- Make the political settlement more inclusive and stable. This may require political reconciliation with armed militant groups and steps to ensure free and fair elections so that genuine representatives of the people are elected.

- Alter the federal design to either create a greater incentive for the emergence of cross-ethnic political parties or enable ethno-regional parties to get a simple majority in the provincial assembly. The latter can be achieved through the enhancement of the powers of the Senate and the former can be achieved through the division of the province into two provinces. Both are likely to reduce political fragmentation across ethno-regional lines

- Identify, engage, and recognise political champions of education so that they have the incentive to advocate for education reforms in public as well as agenda-setting debates.

- Identify and harness key political moments to leverage a greater focus on improving education outcomes.

- Devolve day-to-day administrative affairs of education to lower tiers to promote local accountability and reduce the unnecessary burden at the provincial level.

- Generate political incentives to focus on access and learning outcomes by supporting data-based information campaigns that highlight issues of out-of-school children and poor education quality.

- Create data-based tools that may enable civil society and other actors on the demand side of education to measure progress on education outcomes and attribute progress or decline to political representatives.

- Promote social awareness by supporting campaigns that highlight the unhealthy role of tribal social norms and sensitize local communities about the need to engage in school affairs.

MEASURING THE ACCESSIBILITY BENEFITS OF PUBLIC TRANSPORT: EVIDENCE FROM LAHORE ORANGE LINE METRO TRAIN (OLMT)

Alvina Sabah Idrees and Saima Sarwar

INTRODUCTION

Rapid urbanisation and migration towards Lahore are causing inadequacy in public service delivery, most notably public transport. The Lahore Orange Line Metro Train (OLMT) is the first light rail mass transit project in Pakistan to cater to the needs of the growing population of the city. The goal of any public transport planning is to increase accessibility in terms of proximity, affordability, mobility, convenience, connectivity, social acceptability, and social inclusion. However, each of these goals cannot be achieved simultaneously and policy faces a trade-off.

Similarly, affordability and financial sustainability of a transport system are the two aspects that cannot be met together. The transport service either end up relying on high levels of subsidies or charging transit fares that are too expensive for the city's poor. Currently, the OLMT is not being utilised to its full capacity, which is resulting in a deficit and a further cut in the fare is not an appropriate solution to incentivise its usage. Therefore, a balanced financial sustainability approach is required to limit the fiscal burden and generate revenue streams.

This policy brief, based on the Lahore OLMTs ex-post evaluation, provides guidelines for policymakers on the mass transit system's suitability and replication in other major metropolitan cities of Pakistan. In addition, it identifies policy gaps for improving accessibility by removing hurdles for non-users and increasing ridership. The study, on which this policy brief is based, also highlighted heavy subsidisation,

which is an undue burden on government resources. Thus, this brief also suggests some viable policy options to make this project financially sustainable.

METHODOLOGY

The study was based on primary data collected from the Lahore OLMT riders and non-riders. The sample consisted of 4,900 riders and 500 non-riders. The analysis was done using different statistical techniques, including descriptive statistics, frequency distribution, contingency tables/cross-tabulations, a non-parametric approach[1] to compare users and non-users, and the multinomial logistic regression to determine the travel demand and behaviour of users and non-users with respect to connectivity and willingness to pay.

FINDINGS

The results show that the majority of the OLMT users (78 per cent) found transportation options in Lahore to be adequate, while the majority of the non-users (59 per cent) faced traffic congestion daily. This shows that non-users of OLMT experienced inconvenience in competing modes of travelling

The non-users did not use the OLMT because 68 per cent of them were unaware and did not have complete information on the Lahore transportation network. Therefore, overcoming this 'information asymmetry' might increase the OLMT ridership and raise revenues.

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[1] Mann-Whitney U test is used to test the hypothesis whether the two independent groups are significantly different.

The Lahore OLMT has contributed towards a 'gender inclusive' transportation mode by improving transportation access to female students along with 'locational efficiency,' i.e., easy access to destinations. The greater proportion were those commuters whose ultimate destinations were workplace (51 per cent) and education (33 per cent). Hence, 'targeted demand-side subsidies' can be offered to office workers and students in the form of special 'smart cards' which might induce more people to shift towards OLMT use. It was also found that most of the commuters, who previously did not use public transport but belonged to vehicle-owning households, were females who faced 'forced immobility' in terms of dependency on a family member for shared transport. Thus, the transit service has contributed considerably to overcoming this barrier by providing safer and more convenient transport.

The major shift factor in favour of the OLMT was the past daily travel expenses as those commuters who shifted to the OLMT saw a reduction in travel expenses. Among the OLMT users, 35 per cent of the commuters were 'choice riders,' i.e., they opted to use the OLMT despite having personal vehicles. However, a larger proportion – 48 per cent – were those commuters who shifted to the OLMT due to the non-availability of the alternatives. This segment of passengers also faced higher travelling costs. Thus, the Lahore mass transit has proved crucial by providing 'basic mobility'.

The OLMT users faced the higher cost of using the mass transit system due to the connectivity gap with the mass transit service. The commuters had to take an additional service, such as a taxi, a rickshaw, or a personal vehicle, to reach the OLMT station both at the entry and the exit. Thus, even if these commuters pay a uniform fare of Rs. 40 per OLMT ride the additional travelling adds to their costs. However, an OLMT ride was cheaper for those who did not require any additional transport. Thus, the transport policy of Lahore needs to be made more compatible with mass transit by improving the connectivity to reduce the travel burden of additional travel costs and public provision of feeder buses can be cost-effective in this regard. So, the provision of affordable connectivity can greatly contribute to an increase in ridership and revenue generation.

On average, the daily expenses that non-users and users were willing to spend were PKR 28 and PKR 146, respectively. This means that the service has contributed greatly toward social inclusiveness for low-income earners as they are more willing to bear a fare increase. Therefore, price discrimination on the concept of progressive taxation can be applied by issuing 'smart cards' for different income groups by further categorizing them into regular and non-regular commuters.

The users of the OLMT had 0.368 times the odds of fully supporting the feeder buses in comparison to non-users of OLMT. The odds of fully or partially supporting the feeder buses by non-users were 2.717 times and 6.291 times higher, respectively, in comparison to the OLMT users as against not supporting the government provision of feeder bus connectivity. These results indicate that the provision of feeder services can induce the non-users to shift towards using the OLMT which can play an important role in increasing ridership.

POLICY RECOMMENDATIONS

One of the important policy interventions is to increase the transit coverage and catchment area through 'connectivity.' The future direction for policymakers is to develop a survey-based optimal design for the feeder bus network system to improve connectivity with OLMT and supplement it with a mobile digital App to overcome the information gap. The app can work on a similar pattern to ride-hailing apps by involving rickshaws. The app should contain information about routes, timings, and expenses per kilometre. Such measures can induce more people to shift towards the OLMT and prevent the present users to discontinue by making the additional travel expenses cheaper and more affordable as compared to prevailing multimodal arrangements of connectivity. This may further create a spillover benefit in terms of employment creation for those involved in providing the 'connectivity service,' especially compensating the rickshaw drivers as the majority of the OLMT riders' past mode of transport was rickshaw.

The burden of government subsidy can be reduced by replacing the uniform user charges with special

targeted 'smartcards' for regular users by grouping them into different income profiles and as per the requirement of the working class, students, and females. In addition, the zoning of ridership fare between peak and off-peak hours and the coverage of distance along OLMT routes is another way of generating additional revenue streams.

The government subsidy can be further eased by searching for alternative sources of revenue generation rather than targeting the ridership only. The public-private partnerships (3Ps) can play an important role in this regard by promoting commercial activities on the OLMT. The OLMT stations are economically valuable for small businesses (such as food kiosks) and revenue sharing through these business ventures can be a source of additional finance for mass transit. The mass transit rail can also be used as an advertisement and marketing medium to generate additional revenue streams. The most immediate intervention is to use the train's display screens for advertisement purposes. This can generate a considerable amount of non-fare revenues for the OLMT service. Similarly, digital screens can also be installed at each OLMT station, which can not only save the stations' running costs of lighting but provide revenue through the provision of a platform for advertisements. Static ads can also be a source of additional revenue for this mass transit. Conversely, rather than just focusing on mobility in isolation, there is a need to follow the global practice of partnerships. The mass transit services in Shanghai and Tokyo have substituted the fare-setting strategy from affordability to service quality, whereas in Hong Kong and Singapore, the

provision of mass transit service is through private partnership and a land development scheme is adopted to capture the land value to recover the costs.

Regarding the feasibility of similar mass transit projects, it must be kept in mind that introducing a mass transit service without the support of a well-knit network and awareness cannot maximise welfare gains. The 'accessibility-by-destinations' is also a necessary element for chalking out the routes for a mass transit service, i.e., access to health and education institutions need to be considered for reaping the full benefits of transit service. These factors must be given considerable weight while devising the feasibility study and replication of similar mass transit in other locations and cities. Transportation demand is 'derived demand' and ridership of mass transit cannot be increased without access to destinations.

Moreover, the provision of public transport is not financially viable in the long run if supported by government subsidies. Being a developing country and facing huge fiscal constraints, it will never be feasible for Pakistan to introduce such innovative public transport interventions solely based on government support. Pakistan needs to follow in the footsteps of Singapore, China (Shanghai), Japan (Tokyo), and Hong Kong where the mass transits are commercially operated rather than depending solely on fare revenue or transferring the burden on government resources. Therefore, public-private partnership is essential for generating additional revenue streams or further advancement in rail mass transit systems in Pakistan.

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