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The Socio-economic Analysis of the Street Economy in the Twin Cities of Pakistan

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The study provides a socio-economic analysis of the street economy using primary data based on a survey of 1,863 fixed street vendors operating in the Twin Cities of Pakistan. Descriptive analysis shows that street vendors, on average, make a significant profit of US$ 212 per month (29 percent of total monthly revenue). They chose to vend due to the lack of formal education and the unavailability of formal sector jobs. Vendors pay more than 51 percent of their operating cost (US$107 per month) as rent to shop owners to place carts/tables in front of shops. About 98 percent of vendors operate without legal protection (e.g. license/permit), leading to frequent evictions. The economic loss constitutes about 62 percent of the monthly revenue (215 percent of the monthly net profit) due to one-time expulsion by the administration. The Multidimensional Vulnerability Index (MVI) shows that around 21 percent of vendors are acutely vulnerable, while more than 25 percent of SVs are vulnerable. Multivariate analysis indicates that socio-economic vulnerabilities negatively and significantly impact monthly profits. These findings provide insights to policymakers and other stakeholders, including entrepreneurs, market associations, regulators, administrative authorities, and social protection agencies, to harness the potential economic benefits of the street economy.

Keywords: Street Economy, Twin Cities, Economic Analysis, Pakistan

1. INTRODUCTION

Pakistan has a large street economy (SE) operated by individuals and micro-enterprises, namely street vendors (SVs), across the country, mostly in urban areas.[1] SVs

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[1] The SE is defined as retailing of skills and materials, manufactured, and supplied through different processes (both formal and informal) to retailing enterprises working informally from the state- or privately-owned public spaces. The SE can also be defined as exchanging all types of goods and services in public areas, streets, sidewalks, and squares (Sirkeci, 2020, p. 14). A public space refers to an area or place that is open and accessible to all people, regardless of gender, race, ethnicity, age, or socio-economic level. The SE is a subset of a broader informal economy.

are a part of the informal economy that provides employment and livelihood to the poor with low skills and literacy and produce numerous social and economic benefits (Martínez, Short, & Estrada, 2018). The SE strongly links the supply chain, comprising both formal and informal players. SVs are just at the retail end of a rather complex supply chain. Despite the massive penetration of SVs in urban markets, the socio-economic structure and the supply chain of SE are unknown due to their informal nature in Pakistan.[2] Street vendors continue to struggle at the margins of the economy. Street entrepreneurs are subjected to abuse, violating their dignity due to a lack of legal status. The failure to recognise them as entrepreneurs has resulted in the loss of national revenue from street vending registration fees, hawking licenses, and taxes (Mazhambe, 2017).

Understanding the characteristics of micro-enterprises operating in SE is vital to design a policy framework to formalise SVs. Unless we know the socioeconomic profiling of informal entrepreneurs, it is difficult to develop targeted policy interventions to promote the street economy (Williams, Shahid, & Martínez, 2016). This study explores the characteristics of the micro-entrepreneurs operating in SE through a comprehensive survey of SVs in twin cities, i.e., Islamabad and Rawalpindi.[3] We also examine the differences in business operations, supply chain, and economic contribution of SVs across two different types of markets. Twin cities host around 3 million people.[4] On average, 1 percent to 1.5 percent of the labour force is engaged in SE (GoP, 2022). Both cities operate under different administrative structures. Markets are relatively well organised in Islamabad compared with Rawalpindi. Furthermore, Islamabad hosts relatively high- and middle-income families, while low- and middle-income families reside in Rawalpindi.

Descriptive analysis, based on primary survey data of 1,863 fixed SVs in twin cities, shows that the lack of formal education and unemployment force individuals to choose the street vending business. The analysis shows that the average monthly revenue of street vendors is Rs. 114,708 (US$ 740) and, on average, makes a significant profit amounting to US$ 212 per month (29 percent of total monthly revenue). Vendors incur around US$ 107 per month in operational costs, and more than 51 percent of the total operating cost incurred by the SVs fell under the category of rent paid to the shop owner. We find that SVs are not integrated with the financial market to use financial services as only 11 percent of SVs has a formal bank account. Around 49 percent of SVs have a mobile banking account, mainly for sending money home, i.e., remittances. The lack of legal protection is a significant challenge that SVs face. We find that 98 percent of SVs operated without legal protection in the market. Due to informality and without legal production, it is noted that 65 percent of SVs face eviction, which is significantly high in sector markets (76 percent) than in non-sector markets (59 percent). We find that total economic loss due to confiscation ranged from US$ 497 in the sector market to US$ 334 in the non-sector market. The reported economic loss due to informality constituted around 62 percent of monthly revenue and 215 percent of net monthly profits.

[2] Global assessments have shown that the SE has grown exponentially, affecting the daily life of 5 billion people, with a volume of US$ 30 trillion (Sirkeci, 2020, p. 11)

[3] Rawalpindi is adjacent to Islamabad—the capital of Pakistan and the two are jointly known as the "twin cities" due to strong social and economic links between the two cities.

[4] According to Census 2017, the urban population of the Rawalpindi tehsil is 2 million while around one million people live in urban areas of Islamabad tehsil. The total population of the Rawalpindi district is 5.4 million and the Islamabad district is 2 million.

We contribute to the literature in many ways. First, the study provides detailed socio-economic profiling of fixed street vendors operating in twin cities in Pakistan. Much of the existing literature has focused on other regions such as East Asia, Latin America, and Africa, with few exceptions from India. For example, studies were conducted in different countries, including the USA (Liu, Burns, & Flaming, 2015), Cambodia (Kusakabe, 2010), Thailand (Kusakabe, 2014; Maneepong & Walsh, 2013), Colombia (Martinez & Rivera-Acevedo, 2018; Martínez, et al. 2018), Vietnam (Thanh & Duong, 2022), China (Sun & Zhu, 2022) and India (Sekhani, Mohan, & Medipally, 2019). Thus, we have a limited understanding of street economy given the significant contextual, economic, and institutional differences across countries. Given the considerable proportion of labour forces involved in the street economy, it is vital to unbundle their profile to design appropriate policies and integration plans.

Another significant contribution of our study is that we develop a comprehensive Multidimensional Vulnerability Index (MVI). We extended the vulnerability index developed by Esayas & Mulugeta (2020) by incorporating local dimensions/elements relevant to twin cities in Pakistan. Further, we use the Alkire-Foster methodology to construct the MVI of street vendors (Alkire, Roche, & Vaz, 2017; Nawaz, 2021; Nawaz & Iqbal, 2021). The MVI captures three broad dimensions of socioeconomic vulnerability: social, vending, and economic. We find that street vendors' illegal and informal status makes their livelihood more vulnerable in cities. The MVI shows that around 21 percent of street vendors are acute vulnerable, while more than 25 percent of SVs are vulnerable. We find that SVs with vulnerable status face a 3.1 percent decline in average profit, and acute vulnerability generates 12.2 percent less profit than the sample means profit. The vulnerability-profit analysis indicates that socio-economic vulnerability adversely impacted the profit margins of the street vendors.

Lastly, we contribute to the literature by quantifying the impact of the MVI along with other factors on profitability. The multivariate analysis showed that socio-economic vulnerability has a negative and significant impact on monthly profits. The monthly profit is 12 percent lower for the "vulnerable" street vendors and 20 percent lower for the "acutely vulnerable" street vendors than for the "not vulnerable" street vendors. The regression results provide valuable insights for policymakers to address socio-economic vulnerabilities attached to street vendors to promote the street economy.

The rest of the paper is structured as follows: Section 2 presents the discussion on data and methodology; Sections 3 and 4 provide results and discussion, while the last section concludes the paper with policy recommendations.

2. METHODOLOGY

This section briefly describes street vending in Pakistan, focusing on twin cities. This section presents a detailed description of data and an empirical strategy to explain the role of socioeconomic and institutional factors in running street vending.

2.1. Setting the Context: Street Vending in Pakistan

The street vending business constitutes a significant portion of the informal economy in Pakistan. According to the Pakistan Labour Force Survey 2020-21, the informal sector absorbs around 72.5 percent of non-agriculture employment, which

constitutes 45.3 percent of the total labour force. This implies that over 30.49 million workers participated in the informal sector (GoP, 2022). The statistics reveal that around 59.8 8 percent of the non-agriculture labour force engaged in the informal sector in Islamabad and over 64.9 percent in Rawalpindi (GoP, 2022). The total number of street vendors operating on streets or roads across Pakistan is 753,690 (around 1.22 percent of the total employed labour force) who are either stall and salespersons, street food salespersons, or street vendors (excluding food). Most street vendors are situated in Punjab, followed by Sindh and Khyber Pakhtunkhwa.

2.2. Data: PIDE Street Economy Survey (PSES)

Our analysis is based on primary survey data, called the "PIDE Street Economy Survey (PSES)", conducted in twin cities, namely, Islamabad and Rawalpindi. The survey covered 1,683 street vendors (SVs) operating in twin cities. Keeping in view the objectives of the study, we only interviewed fixed-street vendors located in the main markets of the twin cities. In Islamabad, we interviewed the entire population of SVs operating in Markaz of 15 sectors.[5] Furthermore, we interviewed SVs in the peri-urban market of Bhara Kahu in Islamabad to capture the regional heterogeneities. In Rawalpindi, two trading hubs were selected for the survey based on the importance of the markets. First, we interviewed SVs in Raja Bazar, a wholesale market, and customers from adjacent districts use this market to buy wholesale products. Secondly, we covered the Commercial Market, one of Rawalpindi's biggest retail markets in terms of offerings. Both spaces have a significant presence of street vendors.

We used the computer-assisted personal interviewing (CAPI) method to collect data using Android tablets and mobiles. The CAPI provides real-time access to data for verification and cross-checks to ensure data quality and transparency. We revised the questionnaire after conducting a pre-testing survey in Bhara Kahu and G9, Islamabad. We hired sixteen enumerators (eight males and eight females) and two supervisors to conduct a survey using the face-to-face interview method in twin cities. We organised a three-day training session at PIDE to train the enumerators. The field survey was conducted from June-July 2021. The final dataset covered 1,683 SVs in twin cities [1,238 SVs in sector markets and 445 in non-sector markets] (Appendix Table 1).[6]

We used a structured questionnaire to collect information on the socioeconomic profiles of SVs, their business operations, supply chain, financial inclusion, economic contribution, and administrative challenges. The survey results showed that the average age of respondents (street vendors) was 32.9 years, and among them, 75 percent of SVs were married. The lack of education is one of the key determinants of adopting informal businesses such as street vending (Smith & Metzger, 1998). Among respondents, 24 percent had no formal education, 21 percent had below primary education, 44 percent had up to 10 years of education, and 11 percent had intermediate and above education. These statistics suggest that most of the SVs had low education

[5] Sectors are administrative divisions of Islamabad. Each sector covers an area of approximately 2KM×2KM and divided in four sub-sectors (residential) and a centralized commercial market, called "Markaz".

[6] Sector markets include all commercial markets located in commercial areas (Markaz) of sectors in Islamabad. Non-sector markets include peri-urban markets located in Islamabad and commercial hubs (Raja Bazar and Commercial Market) located in Rawalpindi.

and hence, had less chance of getting a job in formal sectors of the economy. The average household size was 8.1, a relatively larger household size compared to the national figure. Appendix Table 1 shows that around 60 percent of SVs were migrant workers who migrated from other districts across Pakistan. About 58 percent of SVs lived with family members, while approximately 35 percent lived alone in rented houses. The data shows that around 90 percent of SVs lived in rented houses. Notably, more than 90 percent of SVs lived in rented places in Islamabad compared to 84 percent in Rawalpindi and other peri-urban areas.

2.3. Developing a Multidimensional Vulnerability Index (MVI)

The illegal and informal status of street vendors makes their livelihood more vulnerable in cities (Brata, 2010; Esayas & Mulugeta, 2020). Vulnerability is the extent to which persons or things are likely to be affected (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011).[7] In the street vending analysis, vulnerable individuals (SVs) cannot cope with socioeconomic shocks due to either weak resilience against economic shocks or a lack of legal protection in vending businesses to cope with the risk of eviction.

The literature has documented various levels of socioeconomic vulnerability faced by street vendors in cities of developing countries. To empirically examine the socioeconomic vulnerability of street vendors in twin cities, we used the framework created by Esayas & Mulugeta (2020) with some modifications. We used three broad dimensions to capture the socioeconomic vulnerability of street vendors, namely social vulnerability (V1), vending vulnerability (V2), and economic vulnerability (V3).

(a) Social vulnerability (V1) of SVs refers to the socio-demographic factors that affect the resilience of SVs (Flanagan, et al. 2011). Limited access to social capital, such as education, age (a proxy for health and experience), marital status, and social statuses, such as residence and living status, may affect the resilience of an individual to cope with socioeconomic risks. The socially vulnerable SVs are less likely to have alternative means of business to cope with business shocks. We used five indicators to define social vulnerability among SVs. These indicators included education, age, marital status, residence, and living status.

(b) Vending vulnerability (V1) of SVs refers to the vending business characteristics that affect the resilience of SVs to cope with administrative and legal challenges to run their businesses. In vending vulnerability, we used four indicators: vending timing, ownership status, eviction, and legal status.

(c) Economic vulnerability (V3) of SVs refers to the economic conditions determining their resilience to running and expanding the vending business. In economic vulnerability, we used four indicators: income, experience, loan, and bank account.

[7] Vulnerability is a "state of defencelessness against adverse shock that could inflict damage to an agent or system" (Gallardo, 2018). Gallardo (2018) argues that "a state of vulnerability can be characterized either by the presence of certain weaknesses or internal conditions inherent to the agent or system in question (which determine their state of defencelessness) or by the presence of certain probable external shocks, to which the agent or system does not have the ability to cope."

We used the Alkire-Foster methodology to construct a multidimensional vulnerability index (MVI) of street vendors (Alkire, et al. 2017). Appendix Table 2 describes each indicator used in the construction of MVI along with theoretical justifications. We assigned equal weight to each dimension and set the equal weight to each indicator within each dimension.[8] We calculated the vulnerability score of each street vendor using the following formula: $MVI_{i\in[0,1]:} = \sum_1^{13} w_i I_i$. Where $I_i \in \{0,1\}$: 1 if a street vendor was vulnerable in indicator i and 0 otherwise. w_i is the weight assigned to each indicator i. The descriptive analysis shows that the mean vulnerability was 0.562 with a standard deviation of 0.115. Using the mean and standard deviation of MVI_i, we defined four vulnerability levels, including "not vulnerable ($MVI_i \leq 0.447$)", "mild vulnerable ($MVI_i > 0.447$ &$MVI_i \leq 0.562$)", "vulnerable ($MVI_i > 0.562$ &$MVI_i \leq 0.677$)" and "acutely vulnerable ($MVI_i > 0.677$)". Esayas & Mulugeta (2020) used a similar approach to define various levels of vulnerability among street vendors.

2.4. Factors Affecting Profits of Street Vendors: Multivariate Analysis

Given the important role of street vendors in economic activity, it is necessary to determine the factors affecting the street vendor's profit. To examine the impact of various socioeconomic factors (vulnerability) and business-related factors on the profits of street vendors, we defined a simple regression model as given below:

$$\ln(\pi_i) = \alpha + \varphi S_i + \lambda M_i + \delta_i Z_i + \nu_i$$

Where $\ln(\pi_i)$ is the average monthly profit after taking the log, S represents the sale item, M captures different markets, Z is a vector of socioeconomic variables, and ν_i is the error term. In this case, Z captured various levels of socioeconomic vulnerabilities calculated in the previous section. In the above equation, φ, λ and δ_i are estimated coefficients.

3. RESULTS AND DISCUSSION

3.1. Street Vending Characteristics

Table 1 shows that, on average, vendors had 10.5 years of experience in the street vending business. The fixed vendors used different structures for vending their products. The survey data shows that around 61 percent of SVs used tables and 32 percent used carts for vending. Using tables for vending reflects a bit of permanence as most tables are placed in front of shops. The descriptive statistics show that 84 percent of SVs owned vending carts/tables, and around 86 percent also owned vending businesses. Martínez, et al. (2018) found similar ownership patterns in Colombia. These statistics reflect that street vendors are self-entrepreneurs with more than 10 years of working experience. We found that around 86 percent of street vendors, on average, worked for more than 10 hours per day. We found that working hours were relatively higher in non-sectors markets than in sector markets. Around 92 percent of SVs worked more than 10 hours a day in non-sector markets compared to 83 percent of street vendors in sector markets. Similarly, most street vendors (more than 91 percent of SVs) worked seven days a week, showing long working hours without any breaks.

[8] Various studies have used a similar approach to assign weight to different dimensions and indicators (Alkire & Foster, 2011; Awaworyi Churchill, Iqbal, Nawaz, & Yew, 2021; Iqbal & Nawaz, 2017; Maduekwe, de Vries, & Buchenrieder, 2020; Nawaz & Iqbal, 2016, 2021).

Table 1

Street Vending Characteristics

Variables	Sector-Market	Non-Sector-Market	All
Vending experience (years)	10.5	10.5	10.5
Vending category (%)			
Cart	33.6	27.0	31.9
Table	60.6	62.9	61.2
Sheet/others	5.8	10.1	7.0
Ownership of cart/table (owned %)	83.9	85.2	84.3
Ownership of vending business (owned %)	83.8	93.7	86.4
Vending location or placement (%)			
In front of a shop	47.5	46.7	47.3
Sidewalk	48.2	51.9	49.2
In front of a plaza/other	4.3	1.4	3.5
Vending working hours (%)			
4-10 hours	16.56	8.09	14.32
More than 10 hours	83.44	91.91	85.68
Vending working days (%)			
Seven days	90.5	93.3	91.2
Less than seven days	9.5	6.7	8.8
Average employees, including the owner (No)	1.19	1.07	1.16

Source: Author's calculation based on PSES.

Note: Sector markets include all commercial markets located in commercial areas (Markaz) of sectors in Islamabad. Non-sector markets include peri-urban markets in Islamabad and commercial hubs (Raja Bazar and Commercial Market) in Rawalpindi.

The descriptive statistics show that food, garments, fruits/vegetables, ladies' handbags, and electronic and plastic items were the main selling products in the street vending economy (Appendix Figure 1). Around 26 percent of SVs offered food-related items for sale, which included packed food/snack, and food prepared with fire and without fire. Approximately 22 percent of SVs offered garments for sale – the second largest category of sales item offered by SVs after food items. Around 15 percent of SVs offered fruits and vegetables for sale, followed by shoes, sunglasses, and watches (13 percent), plastic items (8 percent), electronic and mobile accessories (8 percent), and ladies' bags and jewellery (5 percent).

The survey respondents (SVs) presented various reasons to start a vending business. The descriptive statistics show that around 43 percent of SVs reported starting a street vending business due to unemployment. Dzaramba & Marumure (2021) found that unemployment is the highest contributor to street vending in Zimbabwe. Around 40 percent of SVs documented joining vending businesses due

to unemployment in Zimbabwe (Dzaramba & Marumure, 2021). Furthermore, around 26 percent of SVs mentioned that they started street vending businesses willfully due to significant returns. About 23 percent of street vendors stated that they opted for the street vending business due to a lack of formal education and experience to be engaged in formal employment or any other business. A small portion of SVs (around 8 percent) reported that street vending was their family business (Appendix Figure 2).

3.2. The Economics of Street Vending

This section presents information on business operations, economic linkages, income, sales, and profits of the street vending business. We use descriptive statistics to conduct an economic analysis of the street vending business. As mentioned above, we collected data from the sector and the non-sector markets. We used the standard t-test with a confidence interval of 95 to explain the significance of differences across the two markets.

3.2.1. *Formal-informal Economy Linkages*

We found that street vendors in both markets located their stalls (tables/carts) outside formal stores using the available public spaces and sidewalks. Around 47 percent of SVs were situated in front of shops, and over 49 percent used sidewalks for their businesses (Table 2). The street vendor respondents informed that owners of the formal shops charged for the use of public space in front of their businesses. In some cases, the owners of the formal shops hired a worker (around 15 percent of SVs) to operate a stall in front of the shops.

These findings reflect that formal-informal linkages benefit both formal shop owners and street vendors. Martínez, et al. (2018) argued that the formal-informal nexus benefits both owners of formal shops and street vendors due to strong linkages. Formal business (shops) benefits from the pedestrian traffic that street vendors attract by selling low-cost products. On the other hand, street vendors use the formal sector to buy products and use storage spaces. We found that wholesalers/distributors (mainly working in the formal sector) were the major input providers for street vendors in both markets. Around 70 percent of SVs purchased raw materials and other inputs from wholesalers/distributors. Around 26 percent of SVs used the marketplace (*Mandi*) to buy raw materials and other inputs. Very few (around 4 percent of the SVs) used middlemen as a source to purchase raw materials and other inputs for street vending (Table 2). Martínez, et al. (2018) also found that wholesalers were the major input providers for street vendors in Colombia.

We found that around 73 percent of SVs used stall spaces to store sales items, while approximately 18 percent used warehouses to store sales material (Table 2). The street vendors reported that formal shop owners provided storage spaces on rent to store sales items. This also reflected bi-directional dependence between formal shop owners and street vendors to generate business returns.

Table 2

Business Operations: Formal-informal Economic Linkages

Variables	Sector-Market	Non-Sector-Market	All
Source of Purchase of Raw Material/Inputs (%)			
Wholesale/Distributor	70.8	67.9	70.0
Marketplace	23.9	30.8	25.7
Middleman/others	5.3	1.4	4.3
Product (Sales Items) Storage Place (%)			
On-spot	74.1	69.0	72.7
Warehouse	16.3	20.7	17.5
At Home/others	9.6	10.3	9.8

Source: Author's calculation based on PSES.
Note: See Table 1.

3.2.2. *Business Operations: Revenues, Investment, Profits, and Operational Costs*

The descriptive analysis shows that the average monthly revenue of street vendors was Rs. 114,708 (US$ 740) for the full sample. Street vendors operating in sector markets generated relatively higher revenues (US$ 746) compared to non-sector markets (USS$ 725). However, the standard t-test showed differences in revenues were not significant. The economic transactions (sales of items and services) of street vendors contributed directly to the socio-economic development of the city since street vendors provided low-cost food items and other daily use items to low- and middle-class society in the city. Martínez et al. (2018) argued that low-price products and food supplies by street vendors had a direct impact on the economic and social development of the city's poor segments.

The analysis revealed that street vendors, on average, earned a significant profit that amounted to Rs. 32,862 (US$ 212) per month (29 percent of total monthly revenue). Street vendors operating in sector markets earn a relatively higher profit of Rs. 33,637 (US$ 217) compared to vendors running a business in non-sector markets who earned a profit amounting to Rs. 30,846 (US$ 199). The standard t-test shows that sector market profit was significantly higher than the non-sector market (Table 3). This implies that businesses were more profitable in sector markets than in non-sector markets. The apparent reason for relatively high profits in sector markets was the economic status of the customers. The customers in sector markets mainly belong to the middle-income group, while in non-sector markets, customers belong low-income quintile. Generally, profit margins were higher in rich urban markets such as sector markets (Markaz) in Islamabad. Martínez, et al. (2018) found that average profit varied between 21 percent and 40 percent in street vending businesses, depending upon the market structure.

The descriptive analysis shows that street vendors invested, on average, US$ 571 to run a vending business. There was a significant difference in investment requirements across the two markets. We found that the average investment in sector markets was US$ 626, while it was US$ 419 in non-sector markets. This shows that starting a vending business in a non-sector market is cheaper than in a sector market due to cheap inputs and low operational costs. Around 60 percent of SVs invested their own money to start a street vending business, followed by 32 percent of SVs who took money from their family and

friends to invest in the business. Very few street vendors (only 8 percent) took a loan from formal and informal sources to invest in the street vending business (Table 3).

The analysis shows that street vendors held, on average, an inventory of US$ 498 to earn a profit from the street vending business. There was a significant difference in average inventory across markets. We found that the average inventory in sector markets was higher (US$ 544) than in non-sector markets (US$ 371). Interestingly, if we compare the profit ratio with investment and inventory requirements, we found that profit share was relatively higher in non-sector markets compared to sector markets due to small investment requirements.

Table 3

Business Operations: Revenue, Profit, and Investment

Variables	Sector-Market	Non-Sector-Market	All	T-test [Pr(T > t)]
Monthly Revenue (Average)				
				0.72
PKR	115553	112358	114708	[0.24]
US$	746	725	740	
Monthly Profit (Average)				
				2.30
PKR	33671	30860	32927	[0.01]
US$	217	199	212	
Profit as % of Total Income (%)	29.1	27.5	28.7	
Investment (Average)				
				4.21
PKR	97034	64991	88562	[0.00]
US$	626	419	571	
Sources of Investment (%)				
Own Money	59.0	62.7	60.0	
Family and Friends	33.6	29.2	32.4	
Loan/Committee/Credit	7.4	8.1	7.6	
Inventory (Average)				
				2.19
PKR	84271	57489	77189	[0.01]
US$	544	371	498	

Source: Author's calculation based on PSES.

Note: See Table 1. Probabilities are reported in brackets. For currency conversion, we assume 1 US$ = PKR 155.

Apart from input costs (for raw materials and other services), we explored the operational cost incurred by street vendors to run their businesses. We found that a street vendor pays around US$ 107 monthly as an operational cost. The analysis showed a significant difference in operational costs across both markets. The descriptive analysis revealed that street vendors, on average, incurred approximately US$ 115 in sector markets and only US$ 85 in non-sector markets (Table 4). These findings exhibit that running a business in sector markets was costly due to high operational costs. We bifurcated total operational costs into various components. Interestingly, we found that more than 51 percent of the total operational costs incurred by the street vendors fell in the category of rent paid to the owner of the shop.

These findings reinforce the argument of strong formal-informal economic linkages. On the one hand, street vendors earn significant profits from street vending businesses, while on the other hand, formal shopkeepers earn profit in two ways. First, owners of shops receive direct rent from street vendors to run businesses in front of their shops. Second, the sales of formal shop owners increase due to the flow of pedestrians, mainly visiting vendors. Apart from shopkeeper rents, street vendors paid a small amount to the local administration and market committee as fees. Furthermore, street vendors paid around 8 percent of operational costs for basic utilities such as electricity, water, and other services. About 13 percent of operational expenses were in the transportation category, and 25 percent were other costs.

Table 4

Business Operations: Operational Cost Other Than Inputs

Variables	Sector-Market	Non-Sector-Market	All	T-test [Pr(T > t)]
Monthly Operational Costs (Average)				
PKR	17894	13193	16651	5.42 [0.00]
US$	115	85	107	
Head-wise Operational Costs (%)				
Shopkeeper	51.9	48.2	51.1	
CDA/RDA Charges	1.9	3.6	2.3	
Cleaning	0.4	0.4	0.4	
Utilities	8.5	3.4	7.5	
Market Committee	0.1	0.5	0.2	
Transportation	14.3	10.8	13.5	
Others	22.9	33.1	25.0	

Source: Author's calculation based on PSES.
Note: See Table 1 & Table 3.

3.2.3. *Business Operations: Financial Inclusion*

The importance of financial inclusion in promoting micro, small and medium enterprises (MSMEs) is well-documented in the literature (Demirgüç-Kunt & Singer, 2017; Ibor, Offiong, & Mendie, 2017; Irankunda & Van Bergeijk, 2020; Khawaja & Iqbal, 2019). Financial inclusion, such as saving accounts, loans, and business transactions, positively and significantly impacts the operations and growth of MSMEs, leading to inclusive growth and economic development (Demirgüç-Kunt & Singer, 2017; Ibor, et al. 2017; Nandru, Chendragiri, & Velayutham, 2021). Despite the significant contribution of financial inclusion, the global evidence shows that the use of financial services among street vendors is very low (Irankunda & Van Bergeijk, 2020; Martinez & Rivera-Acevedo, 2018).

The descriptive analysis shows that only 11 percent of SVs had any type of bank account. These statistics reflect that the ratio of formal bank accounts is very low among street vendors operating in non-sector markets (only 6 percent of SVs had a bank account) compared to vendors doing business in sector markets (13 percent of SVs had a bank account). With respect to the nature and the use of bank accounts, we found that among

those SVs who had bank accounts, around 24 percent of SVs used bank accounts for trading purposes. In comparison, around 50 percent of SVs used bank accounts for saving purposes, and around 25 percent used bank accounts to send money home (Table 5). This implies that apart from very low financial inclusion, the use of bank accounts is also limited to non-productive uses.

Over the last few years, mobile banking has been expanding exponentially in developing countries, including Pakistan. We found that around 49 percent of SVs had mobile banking accounts. Interestingly, mobile banking use was significantly higher in non-sector markets than in sector markets. In non-sector markets, around 56 percent of VS had mobile banking accounts, while only 47 percent of SV had mobile banking accounts in sector markets. This shows that SVs preferred mobile banking accounts, primarily due to easy access and quick payment. With respect to the use of mobile banking accounts, we found that, among those SVs who had mobile bank accounts, around 50 percent of SVs used mobile banking accounts for sending money home, i.e., remittances.

Furthermore, around 37 percent of SVs used mobile banking accounts to make business transactions, such as making and receiving payments. This implies that easy access to financial services would induce street vendors to use the financial system to expand their businesses. Martinez & Rivera-Acevedo (2018) argued that street vendors are generally excluded from the formal financial sector, hence, rely on the informal sector for lending.

Table 5

Financial Inclusion and Business Operation

Variables	Sector-Market	Non-Sector-Market	All	T-test [Pr(T > t)]
Bank Account (%)	13.1	6.3	11.3	3.90 [0.00]
Bank Account Purpose (%)				
Payment to Traders	25.3	17.9	24.2	
Savings	50.6	50.0	50.5	
Sending Money Home	24.1	32.1	25.3	
Mobile Account (%)	47.0	56.2	49.4	-3.32 [0.00]*
Mobile Account Purpose (%)				
Payment to Traders	36.1	37.6	36.5	
Savings	13.8	12.0	13.2	
Sending Money Home	50.2	50.4	50.2	

Source: Author's calculation based on PSES.
Note: See Table 1 & Table 3.

The analysis shows that around 34 percent of SVs took loans from various sources. Among those SVs who took loans, around 54 percent of SVs took loans from friends and family members for starting a business, while 41 percent of SVs took loans from informal lenders. Only 5 percent of SVs used the formal sector, such as banks and microfinance institutions, to take a loan. This again reflects that SVs are weakly integrated into the formal financial sector for business purposes. The analysis shows that SVs took, on average, US$ 864 loans from these sources, either to make an investment or meet consumption needs (Table 7). Martinez & Rivera-Acevedo (2018) showed that informal lenders charged very

high-interest rates, maintaining a vicious indebtedness cycle. Various studies show that informal money lenders charge very high-interest rates, ranging from 10 percent to 12 percent per month (Qadir, 2005).

Table 6

Business Operations: Loan

Variables	Sector-Market	Non-Sector-Market	All	T-test [Pr(T > t)]
Loan Taken by SV (%)	34.3	33.9	34.2	
Loan Amount (Average)				
PKR	138929	119623	133868	1.20 [0.11]
US$	896	772	864	
Sources of Loan (%)				
Family and Friends	58.6	40.4	53.8	
Informal Lending	36.5	53.0	40.8	
Bank/Microfinance	4.9	6.6	5.4	

Source: Author's calculation based on PSES.
Note: See Table1 & Table 3.

3.3. Vending Licenses and Cost of Eviction

The lack of legal protection is one of the major challenges faced by street vendors. In the absence of a vending license, SVs always remain on tenterhooks. The lack of legal protection leads to harassment, confiscation, and arbitrary evictions (Roever, 2016). Even high-earning vendors at shop fronts are exploited by shopkeepers with an arbitrary increase in rents. The local administration also exploits the illegal status of vendors and earns rent from street vendors.

The descriptive analysis shows that only 2 percent of SVs had licenses to operate in the market. This implies that 98 percent of SVs were operating without legal protection in the market. It is also important to note that around 12 percent of SVs had applied for licenses to local administration (Appendix Figure 3). The illegal status of SVs induced the local administration to confiscate the material and evict the street vendors. The analysis shows that 65 percent of SVs faced eviction, which was significantly high in sector markets (76 percent) than in non-sector markets (59 percent). Around 25 percent of evicted street vendors got a receipt for confiscated material. This shows that the majority of street vendors did not get any legal documents as evidence to claim confiscated material. Around 65 percent of street vendors reported that they did not get back their confiscated material. This again shows massive exploitation by the local administration to extract rents from street vendors.

The analysis shows that most SVs reported that their carts/tables were removed from their existing locations. Only 39 percent of SVs claimed that their carts/tables remained intact after confiscation. SVs reported, among those who mention confiscation, that it took, on average, more than seven days to get back their confiscated material. The local administration imposed a penalty of around US$ 9. Around 39 percent of SVs mentioned that confiscation caused a loss of more than 50 percent of their inventory, while 37 percent claimed it caused a loss of between 25 percent to 50 percent of their inventory (Table 7).

Table 7

Confiscation and Eviction

Variables	Sector-Market	Non-Sector-Market	All	T-test [Pr(T > t)]
Ever Evicted (%)	67.3	59.3	65.2	3.02 [0.00]
Received the Receipt of Confiscated Material (%)	23.2	32.6	25.4	-3.06 [0.00]*
Confiscated Material Returned (%)				
No	16.2	12.1	15.2	
Seldom Return	52.7	40.2	49.7	
Yes	31.1	47.7	35.1	
Cart/table Remains Intact (%)	38.3	40.5	38.8	-0.64 [0.74]*
Days to Return Material (Average Days)	7.7	6.2	7.3	1.86 [0.03]
Average Penalty (Average)				
PKR	1525	1115	1417	2.90 [0.00]
US$	10	7	9	
Loss in Inventory due to Eviction (%)				
Less than 25 percent	19.81	32.20	22.79	
Between 25 percent to 50 percent	40.94	27.65	37.74	
50 percent and above	39.26	40.15	39.47	

Source: Author's calculation based on PSES.

Note: See Table 1 & Table 3.

We used reported data on daily income to monetise the economic loss due to confiscation. Table 8 shows that the net loss to inventory, on average, was US$ 267, which was very high in sector markets (US$ 296) than in non-sector markets (US$ 176). The average revenue loss due to business closure ranged between US$ 150 in non-sector markets and US$ 191 in sector markets. Total economic loss due to confiscation ranged from US$ 497 in sector markets to US$ 334 in non-sector markets. The reported economic loss due to informality constituted around 62 percent of monthly revenue in the full sample(215 percent of net monthly profits). This implies that one-time eviction led to almost two months' net profit loss for the SVs (Table 8).

Table 8

Economic Loss of Eviction Faced by Street Vendors Due to Informality

Variables	Sector-Market	Non-Sector-Market	All	T-test [Pr(T > t)]
Net Loss in Inventory (Average)				
PKR	45863	27339	41405	1.38 [0.08]
US$	296	176	267	
Average Penalty (Average)				
PKR	1525	1115	1417	2.90 [0.00]
US$	10	7	9	
Revenue Loss (Average)				
PKR	29603	23294	28038	0.72 [0.24]
US$	191	150	181	
Economic Loss of Informality (Average)				
PKR	76991	51749	70860	
US$	497	334	457	
Cost of Informality as a % Monthly Revenue	66.6	46.1	61.8	
Cost of Informality as a % of Monthly Profit	229	168	215	

Source: Author's calculation based on PSES.

Note: See Table 1 & Table 3. The economic loss of informality is the sum of loss incurred due to inventory loss, penalty imposed by the local administration, and revenue loss due to business closure. We use information reported in Table 7 on loss in inventory and average time (days) to return material and information reported in Table 3 on monthly revenue and average inventory.

3.4. The Political Economy of the Vending Location

The vending location is the key to determining the nature and profitability of the street vending business. We found that vending location was mainly decided by the vendors themselves (48 percent), followed by the shopkeeper (46 percent). Around 15 percent of SVs reported negotiating with existing vendors to place vending carts/tables for vending at a specific location. There was a significant difference in the role of old vendors in location choice among sector and non-sector markets. Further, we found that only 8 percent of SVs reported that the market association was supportive of selecting the vending location. This implies that market association primarily discouraged the entry of new vendors into the market. We found that existing vendors were unwilling to relocate to weekly markets or any other market developed for street vendors. Only 29 percent of SVs were willing to relocate to a new market for vending business. The apparent reason reported was that they wanted to stay at the existing place. Around 43 percent of SVs said they selected the spot for vending based on daily footfall. Around 26 percent of SVs reported that they chose the existing space for vending due to space availability.

Table 9

Political Economy of the Vending Location

Variables	Sector-Market	Non-Sector-Market	All	T-test [Pr(T > t)]
Who Decided about Vending Location (%)				
Shopkeeper	47.7	42.0	46.2	
Own Decision	45.4	53.3	47.5	
CDA/Market Committee/Previous Vendor	7.0	4.7	6.4	
Negotiations Required with Old Vendors for Location (%)	17.8	7.0	14.9	5.53 [0.00]
Supportive Role of Market Association in Locating Decision (%)	10.5	3.0	8.4	5.12 [0.00]
Willing to Relocate if Offered (%)	30.0	27.6	29.4	0.59 [0.17]
Reasons for Selecting Vending Location (%)				
Higher Footfall	39.82	52.81	43.26	
Space Availability	26.82	25.17	26.38	
Networking with Stakeholders and other Vendors	33.36	22.02	30.36	

Source: Author's calculation based on PSES.
Note: See Table 1 & Table 3.

3.5. Socioeconomics Vulnerability of Street Vendors and Profitability

As discussed earlier, we developed a multidimensional vulnerability index (MVI) of street vendors in twin cities. The analysis shows that around 21 percent of street vendors were acutely vulnerable, while more than 25 percent of SVs were vulnerable. These statistics reveal that about 50 percent of SVs were either vulnerable or acute vulnerable.

Both markets had almost similar vulnerability patterns (Appendix Figure 4). Only 13 percent of street vendors were not vulnerable per the multidimensional vulnerability index based on thirteen different indicators. The multidimensional vulnerability index provides valuable policy insights to streamline the informality faced by SVs in the twin cities of Pakistan.

We explored the impact of different vulnerability levels on the SVs' monthly profits. We found that SVs with no vulnerability earned 4.2 percent higher profit than the sample means profit. On the other hand, SVs with the vulnerable status suffered a 3.1 percent decline in average profit, and acutely vulnerable SVs made 12.2 percent less profit than the sample mean profit (Appendix Figure 5). The vulnerability-profit analysis indicated that socioeconomic vulnerability adversely impacted the profit margins of street vendors: the higher the levels of vulnerability, the higher the chances of reduced profits.

4. FACTORS AFFECTING PROFITS OF STREET VENDORS: MULTIVARIATE ANALYSIS

Given the important role of street vendors in economic activity, it is necessary to determine the factors affecting the street vendor's profit. The multivariate regression results are reported in Table 10. We estimated various models to ensure the robustness of the results. In Model 1, we estimated the impact of various levels of socioeconomic vulnerability on monthly profit. We used "not vulnerable" as the base category to find the relative contribution of various levels of vulnerability. In Model 2, we estimated the impact of various items sold by street vendors on monthly profit. We used other/electronic items as the base category in this model. In Model 3, we examined the relative contribution of different market structures to monthly profits by using the non-sector market as the base category. In the last model (Model 4), we combined all the factors in a single regression equation.

The results reported in Table 10 show that socioeconomic vulnerability had a negative and significant impact on monthly profits. We found that monthly profits were 12 percent lower for the "vulnerable" street vendors than for the "not vulnerable" street vendors. Further, we found that monthly profits were 20 percent lower for the "acutely vulnerable" street vendors than for the "not vulnerable" street vendors (Table 10–Model 4). These statistics reveal that an increase in socioeconomic vulnerability adversely affected the monthly profits of street vendors.

The empirical analysis shows that monthly profits were 12 percent higher for the "food" items as compared to "other" items. Similarly, monthly profits were 24 percent higher for the "fruits/vegetables" than the "other" items. The analysis also shows that the street vendors earned 15 percent higher in the "garments" category than "other" items. These findings uncover that food, fruits, vegetables, and garments were the major profitable items sold by street vendors. Earlier, we documented that these three sales items (food, fruits/vegetables, and garments) had a 62.5 percent market share in the street vending business (see Appendix Figure 1). This implies that profit margins influenced the choice of vending items in the market.

Table 10

Factor Affecting Street Vendor's Profit: Multivariate Analysis

	(1)	(2)	(3)	(4)	(5)
Socio-economic Vulnerabilities (Not vulnerable as the base category)					
Mild Vulnerability	–0.048				–0.034
	(0.042)				(0.042)
Vulnerability	–0.131				–0.126
	(0.045)***				(0.045)***
Acute Vulnerability	–0.238				–0.225
	(0.047)***				(0.047)***
Sales Product (Electronics/Mobile Accessories/Others as the base category)					
Food		0.111			0.109
		(0.054)**			(0.053)**
Fruits/Vegetables		0.177			0.216
		(0.059)***			(0.058)***
Beverages/Juices		0.044			0.067
		(0.080)			(0.079)
Garments		0.137			0.143
		(0.055)**			(0.055)***
Ladies' Bags/Jewellery		0.030			0.036
		(0.077)			(0.075)
Plastic Items/Cosmetics/Leathers		–0.061			–0.037
		(0.066)			(0.066)
Shoes/Sunglasses/Watches		–0.042			–0.029
		(0.060)			(0.059)
Market for Business Operation (Non-sector market as the base category)					
Sector Market			0.103		0.119
			(0.030)***		(0.030)***
Reasons to Start Street Vending Business (Others is the base category)					
Unemployment				0.221	0.211
				(0.110)**	(0.107)**
Job Termination				0.364	0.353
				(0.141)***	(0.138)**
Own will				0.217	0.209
				(0.111)*	(0.109)*
Good Business Opportunity				0.413	0.412
				(0.144)***	(0.141)***
Family Business				0.410	0.410
				(0.126)***	(0.123)***
No Formal Education				0.224	0.243
				(0.111)**	(0.109)**
Constant	10.360	10.180	10.181	10.025	9.944
	(0.037)***	(0.048)***	(0.026)***	(0.108)***	(0.122)***
Observations	1,674	1,674	1,674	1,674	1,674
R-squared	0.023	0.022	0.007	0.011	0.064

Source: Author's calculation based on PSES.

Note: OLS-based estimates are presented. We present standard errors in parenthesis [*** p<0.01, ** p<0.05, * p<0.1]. The dependent variable is the monthly profit earned by street vendors (reported profit) in log form.

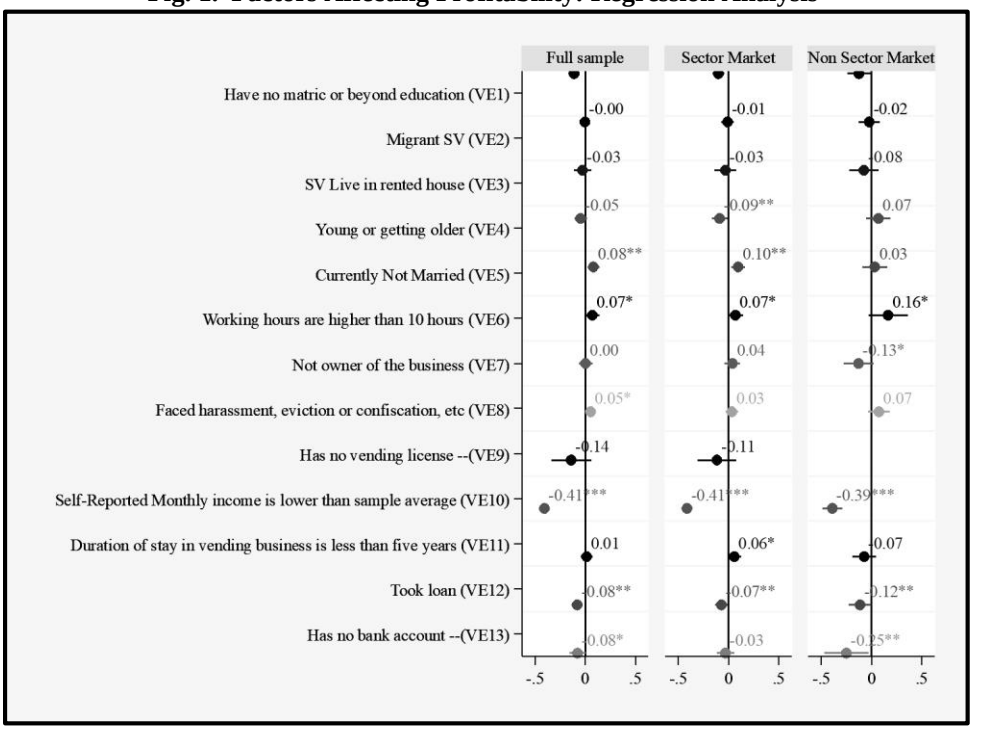
The empirical analysis shows that monthly profits were 13 percent higher in the "sector" markets as compared to the "non-sector" markets. This outcome reflects that profit margins were linked with the income status of residents of the vending area. It is well documented that people in sector areas fall in higher income brackets compared to those in non-sector areas in twin cities.

We also examined the impacts of the reasons to start a street vending business on monthly vending profits. We found that monthly profits were 51 percent higher for the "good business opportunity" category than in the "other" category. This outcome implies that those vendors who joined the vending business with the idea that it was a good business opportunity earned relatively higher profits than other categories. This also reflects that these street vendors might have had better business planning, such as the vending location and selling item choices. We also found that monthly profits were 51 percent higher for the "family business" category than for the "other" category. This implies that street vendors with a business background in street vending might have had a better experience and location to earn higher profits.

To establish the robustness of the results, we estimated the impacts of the factors discussed above by splitting the data across markets. The results are presented in Appendix Table 3. We found that socioeconomic vulnerability, especially "acute vulnerability", significantly negatively impacted monthly profits in both markets. The analysis depicts that the food, fruits/vegetables, and garments categories had positive and significant impacts on monthly profits in sector markets, and fruits/vegetables had a positive and significant impact on profits in non-sector markets. This implies that the profitability of different sale items varied across markets. Lastly, we examined the impact of all the factors on monthly profits using the fixed effects approach. We used the location (sector or market) as a fixed effect factor to capture the regional differences across sectors within sector markets. Based on the fixed effects, the results are presented in Appendix Table 4. We found similar results to those reported in Table 10 and Appendix Table 3.

We further expanded the analysis by conducting an indicator-wise regression analysis. For this analysis, we replaced Z with all the possible indicators used to construct socioeconomic vulnerabilities. The dependent variable was monthly profits earned by street vendors (reported profit) in a log form. We estimated thirteen different models based on each socioeconomic vulnerability indicator. The results are reported in Figure 1. Figure 1 shows that economic indicators such as income, loan, and financial inclusion significantly impacted profitability. However, taking a loan had a negative and significant impact on profitability. Similarly, the lack of a bank account also adversely affected the profitability of the street vendors.

Fig. 1. Factors Affecting Profitability: Regression Analysis



Source: Author's regression estimates based on PSES. Coefficients are reported.
[*** p<0.01, ** p<0.05, * p<0.1]. The dependent variable is the monthly profit earned by street vendors (reported profit) in log form.

5. CONCLUDING REMARKS AND POLICY RECOMMENDATIONS

The economic analysis of street vending in the twin cities of Pakistan provides numerous insights for policymakers and other stakeholders, including entrepreneurs, market associations, regulatory authorities, administrative bodies, and social protection agencies. The survey-based analysis of 1,863 fixed street vendors working in twin cities showed that the lack of formal education and unemployment forced individuals to choose the street vending business as a profession. It is noted that these street vendors, so-called micro-entrepreneurs, migrated from low-income and rural areas to find business opportunities in big cities such as Islamabad and Rawalpindi. These micro-entrepreneurs used carts or tables in front of shops and sidewalks to sell various products, including food, fruits/vegetables, garments, cosmetics, ladies' bags, and electronic products. Most street vendors worked more than 10 hours daily, showing long working hours without any breaks. The analysis indicates that formal-informal solid economic linkages benefit both formal shop owners and street vendors. Based on the analysis, the following implications are noted:

(i) Promoting financial inclusion: The analysis shows that street vendors are poorly integrated with the financial sector to use financial services for business expansion. Financial exclusion undermines business transactions in two ways. First, it restricts business expansion due to low investment and cash transactions. Second, it

hampers business prospects due to high lending costs from the informal sector—money lenders operating in the informal market. Financial exclusion occurs due to a lack of documentation due to migrant status, collateral to obtain financial services, and stringent legal requirements. Financial inclusion can be improved in the following ways:

(a) Reduce the documentation requirements (so-called sludge) to facilitate street vendors, especially migrant workers, to obtain financial services. Mobile banking is an alternative to increase financial inclusion.
(b) The government may allow mobile accounts as collateral to lend loans to street vendors for business purposes. Microfinance institutions (MFIs) should use the mobile account as a security/collateral to expand microfinance.
(c) To address the demand-side issue of financial inclusion, it is proposed that MFIs may devise lending schemes as per an informal committee (informal lending without interest on a rolling basis) to attract street vendors to use the formal financial sector.

(i) Provide legal protection to street vendors: More than 98 percent of street vendors do not have legal protection to run their businesses. Illegality causes a significant economic loss to street vendors. It is proposed that the local administration introduce work permits to qualified street vendors annually to provide legal protection. These permits generate revenues for the government and help standardise street vending products to ensure quality. The work permit may be renewed yearly after providing quality protocols.
(ii) Mechanism to formalise the income: Most business transactions (sales and purchases) occur in cash, which allows tax evasion. The government may restrict the renewal of work permit annual income statements based on formal transactions. Street vendors with no formal transactions may not be allowed to renew their work permits. This helps to formalise the income transactions and ultimately enhance tax collection
(iii) Reducing the cost of informality: As noted, more than 50 percent of the operational cost goes to the shopkeeper as the rent of using public space. The local administration should take appropriate measures to tag public spaces for street vending. Legal protection (mentioned in ii) may also help reduce the cost of informality.
(iv) Address huge inaccessibility of women to urban markets: A few women are involved in street vending business in twin cities due to a lack of proper spaces for women. It is proposed that particular areas or zones may be allocated for women in the street vending business.

APPENDIX

Appendix Table 1

Socioeconomic Profile of Street Vendors

Variables	Sector-Market	Non-Sector-Market	All
SVs Interviewed	1238	445	1683
Age of SV (years)	32.7	33.3	32.9
Household Size of SV (number)	8.2	8.1	8.1
Ever Married (%)	75.3	75.5	75.3
Educational Attainment of SV (%)			
No Education	23.2	26.5	24.1
Primary (class 1 to 5)	19.1	27.2	21.2
Middle (class 6 to 8)	21.2	17.5	20.3
Matric (class 9 to 10)	24.6	21.1	23.7
Intermediate & above	12.0	7.6	10.8
Residence Status of SV (%)			
Migrant	62.5	52.1	59.8
Permanent	37.5	47.9	40.2
Living Arrangements of SV (%)			
Live Alone	34.9	36.6	35.4
Live with Relatives	6.9	5.6	6.5
Live with Family	58.2	57.8	58.1
Housing Ownership of SV (%)			
Rented	92.33	83.6	90.02
Owned	7.67	16.4	9.98

Source: Author's calculation based on PSES.

Note: Sector markets include all commercial markets located in commercial areas (Markaz) of sectors in Islamabad. Non-sector markets include peri-urban markets in Islamabad and commercial hubs (Raja Bazar and Commercial Market) in Rawalpindi.

Appendix Table 2

Dimensions and Indicators of Multidimensional Vulnerability Index (MVI)

Dimension	Indicator	Vulnerable if	Weight	Theoretical justification
V1: Social	VE1: Education	SV has no matric or beyond education	1/15	Education determines the ability of an individual to exploit economic and other opportunities to expand the business and enhance income (Esayas & Mulugeta, 2020; Jiménez, Palmero-Cámara, González-Santos, González-Bernal, & Jiménez-Eguizábal, 2015).
	VE2: Residence	SV is a migrant worker	1/15	Migrant workers are subject to discrimination, such as paying less, hence vulnerable to expanding business (Moyce & Schenker, 2018).
	VE3: Living	SV lives in a rented house	1/15	Homeownership provides economic security by showing residential stability and social standing (Zavisca & Gerber, 2016). Living in a rented house may negatively affect income via rent escalation (Esayas & Mulugeta, 2020).
	VE4: Age	SV is young (age less than 20) or getting older (age>45)	1/15	Age reflects an individual's experience in earning income (Iqbal & Awan, 2015). Being younger or older may increase vulnerability (Esayas & Mulugeta, 2020).
	VE5: Martial Status	SV is currently not married	1/15	Married men performed better than single men (Mehay & Bowman, 2005). Married vendors perform better than unmarried (Esayas & Mulugeta, 2020).
V2: Vending	VE6: Vending Time	Working hours are higher than 10 hours a day	1/12	Long working hours have a negative effect on health and productivity (Park, et al. 2020). Suggesting a better/low overall hourly rate average net profit (Esayas & Mulugeta, 2020).
	VE7: Ownership Status	SV is not the owner of the vending business	1/12	SV with a fully owned status helps to run the business independently (Esayas & Mulugeta, 2020).
	VE8: Eviction	SV faced harassment, eviction, confiscation, etc.	1/12	Businesses are more/less vulnerable to loss (Esayas & Mulugeta, 2020).
	VE9: Legal status	SV has no vending license	1/12	Businesses are more/less vulnerable to loss (Esayas & Mulugeta, 2020).
	VE10: Income	SV's self-reported monthly income is lower than the sample average.	1/12	Income is a proxy of business profitability (Esayas & Mulugeta, 2020).
	VE11: Experience	Duration of stay in vending business is less than five years	1/12	High/ low mastery of vending business (Esayas & Mulugeta, 2020).
V3: Economic	VE12: Loan	SV took loan	1/12	This reflects a lack of personal savings/investment to start a business. SVs feel financially insecure (Esayas & Mulugeta, 2020).
	VE13: Bank Account	SV has no bank account	1/12	Financial inclusion allows SVs to expand business (Irankunda & Van Bergeijk, 2020)

Source: Author's formulation.

Note: We follow the framework developed by Esayas and Mulugeta (2020) with some modifications to select indicators.

Appendix Table 3

Factors Affecting Profits of Street Vendors: Market-wise Analysis

Variables	(1) Sector Market	(2) Non-Sector Market
Socio-economic Vulnerabilities (Not vulnerable as the base category)		
Mild Vulnerability	–0.035	–0.025
	(0.047)	(0.093)
Vulnerability	–0.119	–0.128
	(0.050)**	(0.099)
Acute Vulnerability	–0.207	–0.262
	(0.052)***	(0.102)**
Sales Product (Electronics/Mobile accessories/Others as the base category)		
Food	0.108	0.124
	(0.058)*	(0.135)
Fruits/Vegetables	0.177	0.241
	(0.069)**	(0.124)*
Beverages/Juices	0.068	0.062
	(0.089)	(0.171)
Garments	0.165	0.088
	(0.061)***	(0.126)
Ladies' Bags/Jewellery	0.028	0.077
	(0.083)	(0.176)
Plastic Items/Cosmetics/Leathers	–0.078	0.035
	(0.076)	(0.138)
Shoes/Sunglasses/Watches	0.015	–0.156
	(0.066)	(0.134)
Reasons to Start Street Vending Business (Others is the base category)		
Unemployment	0.210	0.222
	(0.118)*	(0.254)
Job Termination	0.446	0.130
	(0.155)***	(0.307)
Own will	0.214	0.190
	(0.119)*	(0.257)
Good Business Opportunity	0.400	0.546
	(0.149)***	(0.471)
Family Business	0.395	0.445
	(0.138)***	(0.282)
No Formal Education	0.228	0.285
	(0.120)*	(0.257)
Constant	10.057	9.952
	(0.130)***	(0.293)***
Observations	1,231	443
R-squared	0.054	0.089

Source: Author's calculation based on PSES.

Note: OLS-based estimates are presented. We present standard errors in parenthesis [*** p<0.01, ** p<0.05, * p<0.1]. The dependent variable is the monthly profit earned by street vendors (reported profit) in log form.

Appendix Table 4

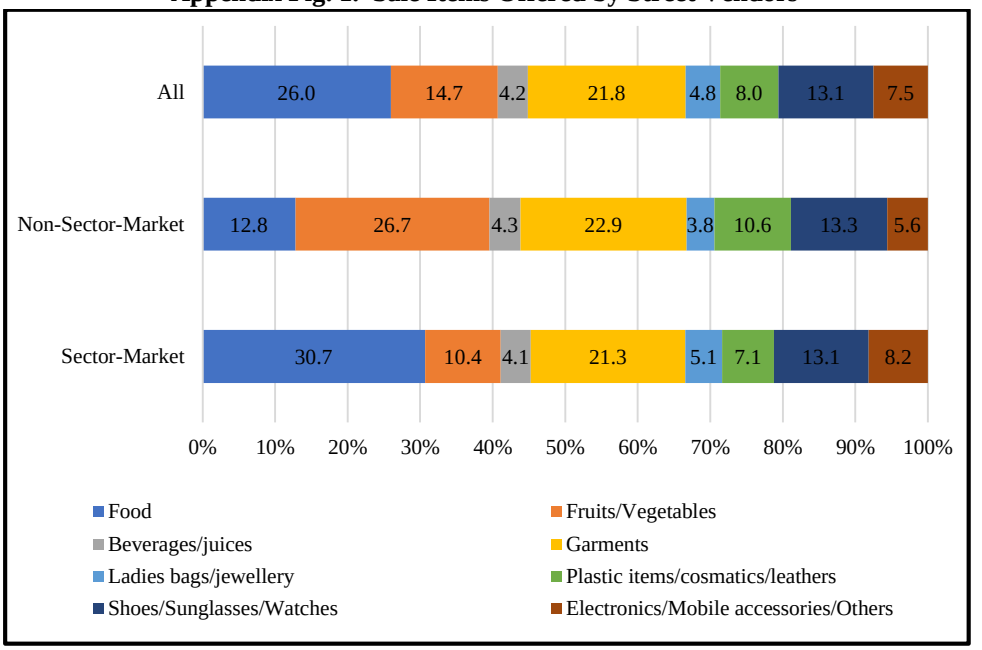
Factors Affecting the Profits Levels of Street Vendors

Variables	(1) Full Sample	(2) Sector Market	(3) Non-sector Market
Socio-economic Vulnerabilities (Not vulnerable as the base category)			
Mild Vulnerability	–0.032	–0.033	–0.020
	(0.042)	(0.047)	(0.094)
Vulnerability	–0.121	–0.111	–0.132
	(0.045)***	(0.050)**	(0.099)
Acute Vulnerability	–0.217	–0.199	–0.246
	(0.047)***	(0.052)***	(0.103)**
Sales Product (Electronics/Mobile Accessories/Others as the base category)			
Food	0.126	0.123	0.140
	(0.055)**	(0.059)**	(0.140)
Fruits/Vegetables	0.234	0.180	0.306
	(0.060)***	(0.069)***	(0.130)**
Beverages/Juices	0.070	0.070	0.086
	(0.079)	(0.090)	(0.172)
Garments	0.124	0.143	0.077
	(0.055)**	(0.061)**	(0.130)
Ladies' Bags/Jewellery	0.006	–0.007	0.059
	(0.076)	(0.083)	(0.181)
Plastic Items/Cosmetics/Leathers	–0.048	–0.089	0.031
	(0.066)	(0.076)	(0.142)
Shoes/Sunglasses/Watches	–0.052	–0.012	–0.163
	(0.060)	(0.067)	(0.137)
Reasons to Start Street Vending Business (Others is the base category)			
Unemployment	0.228	0.235	0.163
	(0.107)**	(0.117)**	(0.256)
Job Termination	0.375	0.482	0.069
	(0.138)***	(0.155)***	(0.308)
Own Will	0.231	0.246	0.133
	(0.109)**	(0.119)**	(0.258)
Good Business Opportunity	0.433	0.425	0.557
	(0.140)***	(0.149)***	(0.471)
Family Business	0.425	0.415	0.390
	(0.124)***	(0.138)***	(0.284)
No Formal Education	0.262	0.255	0.226
	(0.109)**	(0.120)**	(0.259)
Constant	9.993	9.978	9.869
	(0.124)***	(0.134)***	(0.297)***
Observations	1,674	1,231	443
R-squared	0.086	0.083	0.098
Fixed Effect	Yes	Yes	Yes

Source: Author's calculation based on PSES.

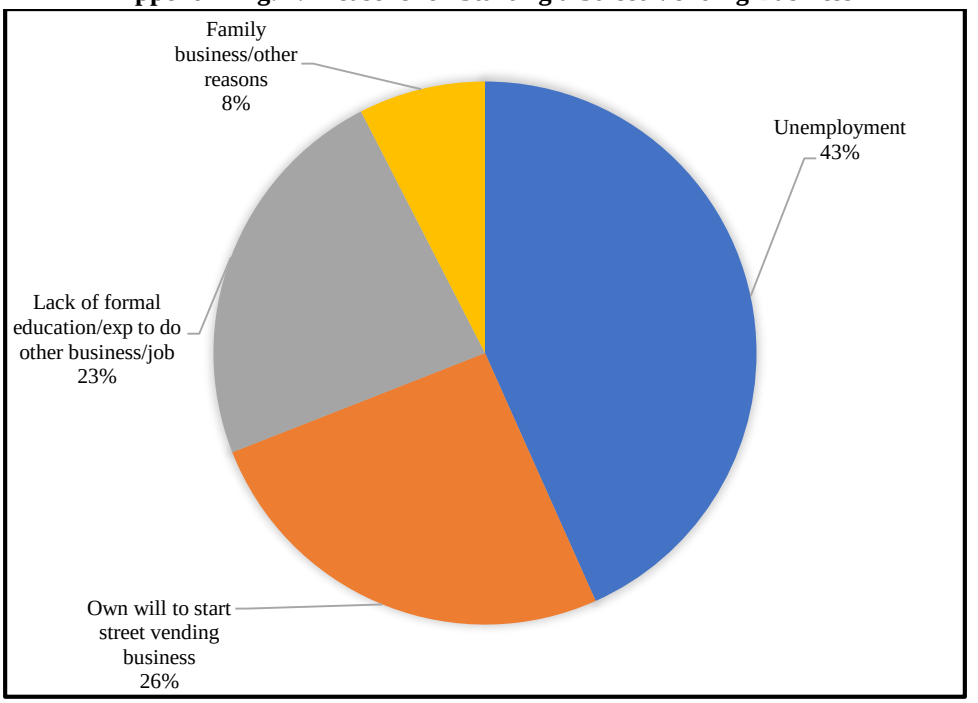
Note: The Fixed Effect based estimates are presented. We present standard errors in parenthesis [*** p<0.01, ** p<0.05, * p<0.1]. The dependent variable is the monthly profit earned by street vendors (reported profit) in log form. We use street vendors' locations as fixed effect factors.

Appendix Fig. 1. Sale Items Offered by Street Vendors



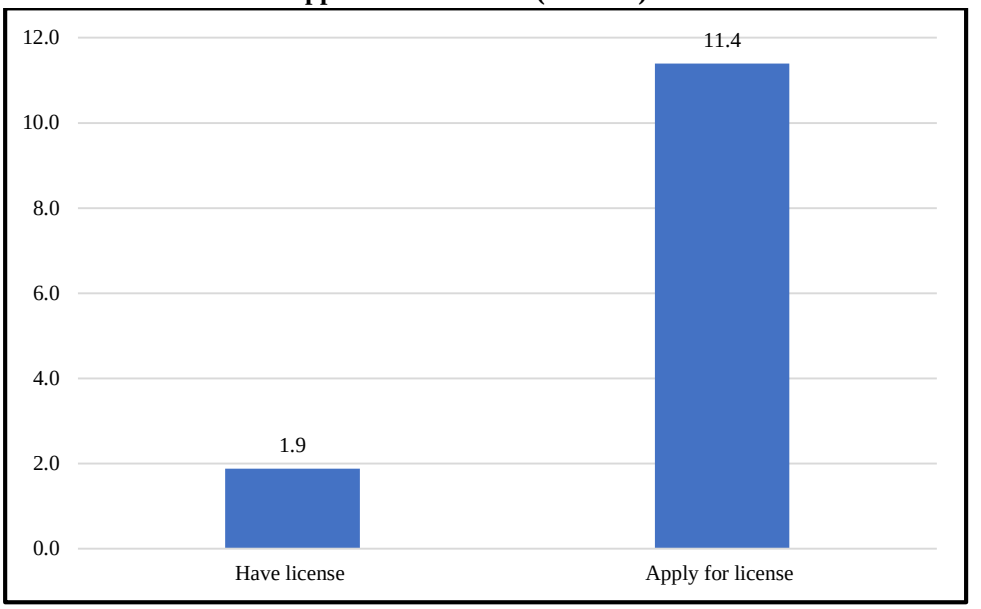
Source: Author's formulation based on PSES.
Note: See Table 1.

Appendix Fig. 2. Reasons for Starting a Street Vending Business



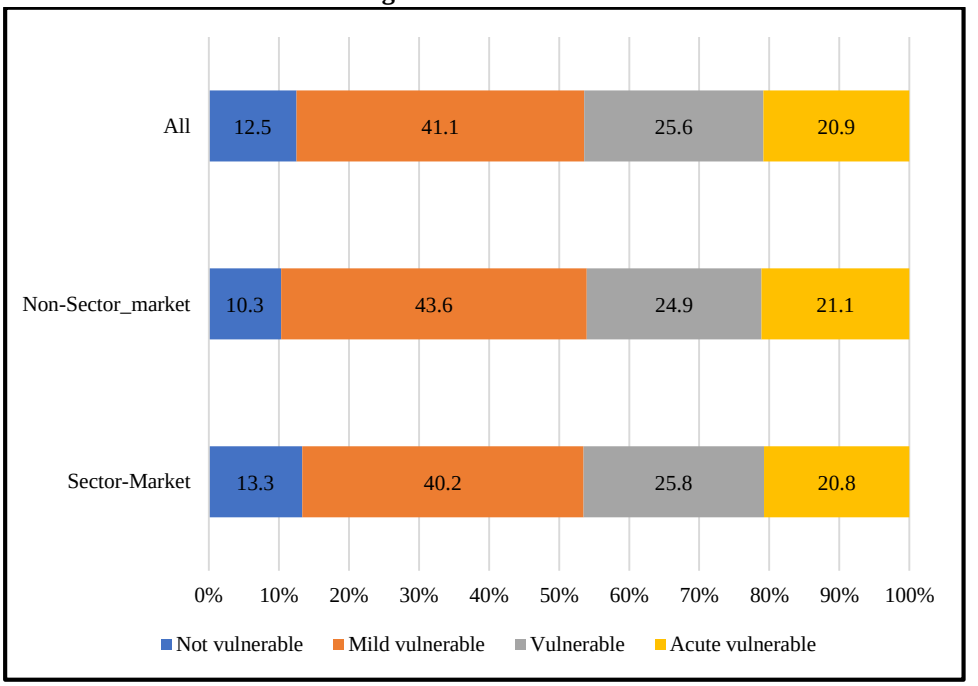
Source: Author's formulation based on PSES.

Appendix Fig. 3. Share of Street Vendors having a Vending License or Applied for a License (%Share)



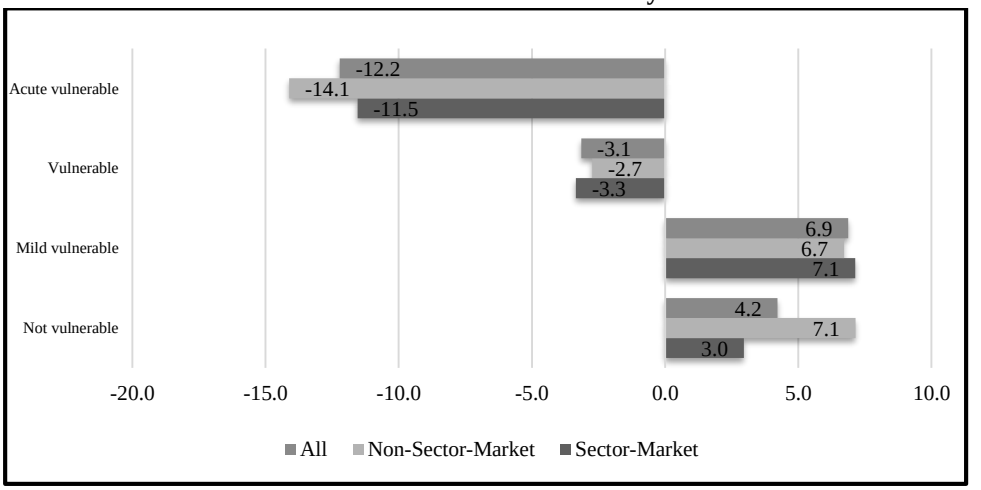
Source: Author's formulation based on PSES.

Appendix Fig. 4. Distribution of Multidimensional Vulnerability among Street Vendors



Source: Author's formulation based on PSES.
Note: See Table 1.

Appendix Fig. 5. Percentage Changes in Profit from the Mean Across Different Levels of Vulnerability



Source: Author's formulation based on PSES.

Note: See Table 1. Percentage changes in profit are defined as the percentage difference between the sample mean value of profit and the mean value of profit in a specific vulnerability level. $\Delta\pi = \left(\frac{\pi_{mean\_level}}{\pi_{samplemean}}\right) * 100$. Where $\Delta\pi$ represents the percentage change in profit, $\pi_{samplemean}$ denotes sample mean (profit) and π_{mean_level} presents mean profit at a specific level.

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Transforming Public Sector Through e-Governance: A Case Study of Khyber Pakhtunkhwa

SHAGUFTA AMAN

Under the motto, '*Technology is Our New Ideology*,' Khyber Pakhtunkhwa's two-time elected Pakistan Tehreek-e-Insaaf (PTI) provincial government is undertaking several key governance reforms for digitising service delivery in various government departments. Taking the two key departments of education and health as case studies, this research investigates how service delivery is impacted through digitisation, what influences are generated on organisational culture, and in what manner it affects citizens' trust in the provincial government. It attempts to do so from the perspective of public service providers, i.e., the bureaucracy, and end users, i.e., the public (school and college students and hospital patients). The study employs both qualitative and quantitative methods to reach its findings. The findings of the study suggest that significant digital interventions were made by the provincial government in both the education and health sectors; the Covid 19 emergency provided a big push for the digitalisation of government services. These interventions are driven by first, the desire to generate policies based on evidence-based data and second, to optimise the efficiency, transparency, and accessibility of public services. The findings of the study suggest that the ICT-induced impacts on service delivery have from a service provider's perception induced greater efficiency, transparency, and accessibility; however, from the end user's perspective, significant constraints remain. The absence of a critical thinking approach behind technology introduction has led to the underperformance of various ICT initiatives. Additionally, there is a propensity of significant groups being left out, either due to the non-availability of resources, such as computers, and the internet, or lack of digital skills and awareness among the end users. The digitisation measures are also steered towards greater government control and less public participation in policymaking, making it as Chadwick and May (2003) suggest a model of managerial government. The findings also suggest that ICT-induced transformations in the bureaucracy's organisational culture have led to veiled resistance and scepticism of the ICT-introduced reforms from the service provider's end.

Keywords: e-government, Information and Communication Technology-ICTs, Efficiency, Transparency, Accessibility in Service Delivery

1. INTRODUCTION

Governance in modern times has undergone significant changes in terms of policies and practices, especially those designed to increase citizen participation in

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broader political processes. The evolution of governance practices in the 20th century and that of the 21st are made possible primarily through growth in modern means of communications and technology. The state today is heavily reliant on information and communication technology (ICT) tools to undertake its responsibilities. This form of governance which relies on electronic communication devices, computers, and the internet to provide services to the people and engage them in the sphere of politics is termed 'e-governance'. The ICT revolution is reshaping the concept of governance in Pakistan, where government bodies, political parties, pressure groups, and other institutions are increasingly using ICTs to engage people in the sphere of politics and governance. The sub-national governments in Pakistan, including the government of Khyber Pakhtunkhwa, are undertaking many e-governance reforms in its various departments, to provide efficient, transparent, and inclusive services in the province.

Pakistan was introduced into the e-governance system comparatively late than its regional compatriots. It was in the year 2000 (August) that the government came up with its first 'National IT Policy and Action Plan' for inducting IT tools in government agencies; 2.6 million PKR were allotted in 2001 to promote 'e-governance in the country' (Ghayur, 2006, p. 1016). This was followed by the establishment of the Electronic Government Directorate (EGD) inside the Ministry of Science and Technology for initiating projects and providing guidelines and standards for software development and related infrastructure. By 2005, the 'E-Government Strategy Five Year Plan,' approved by the National E-Government Council (NEGC) provided for introducing e-applications in all government agencies, delivering efficient, cost-effective, e-services to citizens and ensuring transparency and accountability in decision-making (Ilyas, 2016, pp. 57-58). Very soon the mantra, 'e-governance for good governance' as the basis for transparent, accountable, efficient, and participatory service delivery was getting attention from the policy makers in the field (Ghayur, 2006).

The Pakistan Tehreek-e-Insaaf (PTI) government in Khyber Pakhtunkhwa under its motto 'technology is our new ideology,' claims to take a broader view of e-government to mean not just automation of government departments, but also using technology to provide the public 'a central point of access to government services', thereby placing communities and individuals in 'responsive networks of knowledge, service, trust, and accountability' (G of KP DoIT website, n.d). The completed and ongoing e-government projects are focused on creating IT infrastructure and IT training, Online Hospital Management Information System (HMIS), Virtual Teachers for Schools, the establishment of science and computer labs in schools, system analysis and re-engineering programmes for recruitment and promotion in schools (G of KP DoIT 'Completed Projects', n.d.), touch screen computers for learning of sciences subjects (Naveed, November 29, 2016), and the online college admission system for public sector colleges (Mustafa, June 23, 2017). While these digitisation engagements are supposedly enhancing people's trust in government, there is a need to understand how these are improving the efficiency, transparency, and inclusivity of services in the province, with what impacts the bureaucratic culture.

While revolutionary steps in e-governance are being undertaken by the provincial government in Khyber Pakhtunkhwa, there is a need to understand how such e-governance practices in public management are changing bureaucratic culture and ensuring efficient,

transparent and inclusive service delivery in the Khyber Pakhtunkhwa province. It is further needed to analyse how far the citizen's trust in government is impacted through digitised service delivery. There is hardly any in-depth academic research on digitalisation's impact on service delivery in Khyber Pakhtunkhwa. This necessitates a thorough investigation of how bureaucratic culture and practices are changing and which problems are limiting the effectiveness of ICT tools of governance. The main query underlying this research is: How service delivery in education and health is being transformed through ICT interventions in Khyber Pakhtunkhwa? Therefore, this research investigates the use of ICT tools by the Khyber Pakhtunkhwa Government in education and health for understanding how far digitisation has impacted the bureaucratic culture by generating efficient, transparent, and accessible services. Unless bureaucratic adjustments to technology influences are not researched, it will be difficult to realise the goals of efficient service delivery and grievance redressal, which are the essence of a rational bureaucratic system.

2. LITERATURE REVIEW

The use of technology is today seen as an offshoot of direct democracy in politics. The internet provides a timeless and space-less paradigm of politics (Castells, 2000). Many developing countries have embarked upon the journey of e-governance believing that ICT has the power of reshaping governance. As such, technology has been credited with the renewal of democracy and is termed an 'instrument of democratic liberation' (Chadwick and May, 2003, p. 272). The use of the internet as an active agent for participation in the political process has been defended on several counts. The internet provides a medium for participation in the political process, whilst maintaining the secrecy of their private identities; the subjects could otherwise be discriminated against by the state as being incapable of participating in mainstream politics (Smith, 2015). 'Internet subjects' can even challenge traditional representative democracies, which are subject to the limitations of size, place, and scale. The internet can give more freedom in terms of participation in political debates and decision-making. Andrew Chadwick in his book *Internet Politics* terms the introduction of ICT in governance as the 'renewal of democracy' and calls it an 'instrument of democratic liberation' (Chadwick, 2006).

A further aspect of ICT in politics is that it has lowered the cost of communication between the government and citizens and revitalised the representative system by opening up channels to those who traditionally were not allowed to participate or had constraints of leaving their homes. Among many other advantages of e-government are enhanced efficiency and competence, saving of time, improved communication and coordination between governments, businesses, and citizens, public facilitation through online access to services, greater transparency, and more accountability (Joseph, September 2015). However, the meaningful use of the internet and the ICT for democratic governance depends on the ability of the governments to devise and implement appropriate policies for citizens' participation. Some believe that digital government can 'enhance or erode democratic processes', arguing that this will depend not only on the use of the latest technology but also on 'policy choices, management strategies, and cultural responses' (Dutton, 1999). The ends for which IT is used and citizens' access to it will determine the influence of technologies in democracy and politics in the real sense (Wilhelm, 2000, p. 149).

Some of the published literature suggests that ICTs can be effectively utilised to enhance the dissemination of information, ameliorate public service delivery, ensure governmental accountability, and bring inclusiveness in terms of citizens' participation in governance, thereby enhancing the citizens' trust and confidence in the government (OECD, 2003; Tsankova, 2010; Bhatnagar, 2014; UNDESA, 2018; Anderson, 2009; and Carlo Bertot, et al. 2010). It is assumed that the use of ICT tools in the public sector will enhance efficiency, policy effectiveness, and democratic values (OECD, 2003). Here, e-governance is believed to be a 'good management' strategy and a step towards the 'New Public Management' (NPM) process in this information and knowledge society (Tsankova, 2010). Bhatnagar (2014) argues that since governments are the largest providers of information and services to the people, therefore, their outdated methods of service delivery results in corruption and inefficiency. He suggests that well-designed e-governance projects with process reforms that target enhanced transparency and accountability reduce the discretion vested with civil servants and in turn help enhance efficiency and lower corruption (Bhatnagar, 2014, p. 23). As contended by Rana et al., public organisations in democracies are programmed to deliver services to the citizens and the more the level of accountability, the more efficient public service delivery will be (Rana, et al. 2019). ICTs are argued to ensure transparency, particularly, by granting citizens access to crucial policy-related information and allowing them to keep a check on the government. The ICTs encourage citizens' participation in governance through an exchange of knowledge, ideas, and experiences between them and the government; in this capacity, e-governance is an enabler for the citizens of a state (UNDESA, 2018, p. 5).

It was more than a decade ago that Thomas Barnebeck Anderson (2009) talked about the introduction of the ICT system in the tax departments of the non-OECD countries aimed at reducing contact between the tax collectors and taxpayers and doing away with the opportunities for pay-offs; findings suggested that the use of ICTs (between 1996 to 2006) did reduce corruption in these countries. Similarly, India's online property record system, the Philippines and Chile's e-procurement systems, the US government websites containing information access to data on government expenditure, and the file tracking systems are all examples of e-government usage for reduced corruption and increased transparency (Bhatnagar, 2003; Anderson, 2009). Subhash Bhatnagar (2003) argues that ICT initiatives may reduce corruption and ensure transparency by providing information on government rules, citizens' rights, government decisions and actions, and by the monitoring of government actions, spending, and evaluation of government performance. However, as argued by scholars, cultural influences can prove a daunting challenge to government openness and the anti-corruption therein (Carlo Bertot, et al. 2010). The ICT intervention in transparency is more evident in countries with a tradition of openness. Therefore, it is argued that *'ICTs can be used to promote transparency in cultures that have a tradition of government openness'* (Carlo Bertot, et al. 2010, p. 268). Other compatible evidence is more challenging. In a survey conducted on 1,200 government officials across 70 countries on the issue of how digital technology was transforming the public sector operations and service delivery, an overwhelming majority argued about digital interventions having a major impact on the governments, but a clear majority or around three-fourths of the respondents argued that such digital technologies were disrupting the public sector. It is

interesting to note that most of these governments where surveys were conducted were in the early stages of this journey. Not to mention the fact that around 70 percent of government officials accepted that they lagged behind the private sector in e-service delivery. The study also indicated two drivers for this transformation: cost and budgetary pressures; and citizens' demands (Eggers and Bellman, 2015).

As identified in the literature, the e-government service delivery initiatives in the developing countries have run into many problems, including the lack of political support, issues of digital divide, deficient human resource, and inadequate infrastructure in Kazakhstan (Bhuiyan, 2010); low levels of awareness, poor quality of information, concerns about security of personal information affecting public intention to use e-government services, fewer technological infrastructures, poor IT literacy, organisational characteristics and collaboration with other organisations in Pakistan (Rehman, Esichaikul & Kamal, 2012; Qaisar & Khan, 2010); high illiteracy rate, a lack of ICT infrastructure, low levels of awareness, funding, and commitment on the part of government officials and leadership in Nepal (Sharma, Bao, & Peng, 2014); the lack of coordination, sparse information sharing, low ICT literacy and e-government awareness in Afghanistan (Samsor, 2021); and deficiency of IT infrastructure, low levels of IT knowledge, and little trust in public data protection and information security in Kuwait (Al-Mutairi, Naser & Fayez, 2018). There is an acknowledgement in the literature that developing countries have suffered from high levels of failure with e-government experiments, especially in the formative stages, which mainly resulted from 'reality gaps' between the 'e-readiness' of government organisations and 'large design' ideas of the governments (Heeks, 2001). Hence, there is an emphasis on building institutional and technological infrastructure, awareness levels, and commitment on the part of leaders, as well as the development of adequate human resources and provision of effective legislative support (Heeks, 2001) to make e-government initiatives work without many setbacks and constrictions.

3. METHODOLOGY

Since the research objectives are exploratory and analytical, therefore, a mixed method (MM) of data collection from qualitative as well as quantitative sources was utilised. The research is evidence-based and exploratory because it explores the use of various ICT tools by the Khyber Pakhtunkhwa government for service delivery. It is analytical because such ICT interventions were analysed to understand in what manner service delivery is becoming more efficient, transparent, and inclusive and what if any organisational and cultural changes are taking place in the provincial bureaucracy. The basic premise behind using MM research design is that combining more than one type of data source under multiple research phases (Creswell and Plano Clark, 2011, pp. 7–11) provides a fuller understanding of the research problem than a single or mono-method approach (Guest, Greg & Fleming, Paul, 2015, pp. 581–610).

Qualitative research methods drew on secondary as well as primary sources. In secondary data, books, journals, reports and newspaper articles, and official documents were accessed, including the Khyber Pakhtunkhwa ICT policies and other related policy outlines. The primary data was collected through qualitative semi-structured in-depth interviews from official respondents (BPS 17 and above executive officers who were

involved in policy making and execution) selected through purposive sampling from two sets of government departments. Firstly, from the provincial government, IT-focused departments,[1] including Science and Technology & Information Technology department (ST&IT), Performance Management and Reforms Unit (PMRU), and Khyber Pakhtunkhwa Information Technology Board (KPITB). Secondly, from the provincial government's education and health departments. In education, the Khyber Pakhtunkhwa Elementary and Secondary Education Department (KPESED), Education Monitoring Authority (KPEMA), and Khyber Pakhtunkhwa Higher Education Department (KPHED) and in health, Directorate General Health Services, Health Department, Lady Reading Hospital (MTI), Peshawar and Ayub Teaching Hospital, Abbottabad were targeted for interviews. The reason for choosing the education and health departments was that many of the key ICT interventions here are highly publicised by the provincial government. These departments are primary service providers to the people and people's perception and trust in government are most significantly impacted by how these departments perform their functions. Since the goal of qualitative research is the attainment of saturation, therefore around 25 interviews/ FGDs were conducted from the above-mentioned departments. All interviews were audio-recorded with the permission of the respondents except for 3, who did not permit us to audio-record the interviews with them. In these cases, the information was recorded through descriptive field notes. Analysis and synthesis of the interviews helped find further themes/patterns that emerged in participants' experiences and connections between the experiences.

Table 1

Details of Research Data Collection

Data Collection	Education Departments KPESED & KPHED	Health Department	IT-focused Departments: ST&IT; PMRU; KPITB	Total
Interview	4	7	3	14
FGDs	6	1	4	11
Survey Sites	8	2	–	10
Survey Respondents	201 (Approx. 100 each from schools and colleges	104	–	305

For the quantitative part of the research, a survey questionnaire was used to collect data from a sample size of 305 respondents. The rationale for choosing a 300-sized sample was to represent in equal numbers the end users from secondary-level education (schools), higher-level education (colleges), and major tertiary hospitals. The aim was not only to understand the penetration of ICT tools among end users, i.e., students and patients, but to know how far service generation through ICTs had increased citizens' trust in the provincial government. The standard method for learning public perception and thinking is survey research (Morgan, 1997). The survey questionnaire had three

[1]The IT departments generate, facilitate, promote, and regulate e-government activities in the different government departments at the provincial level.

parts. Part one related to demographics; part two included questions about access to digital tools, awareness about e-government initiatives, and the use of these initiatives; and part three had a Likert scale section to understand the impacts of ICT tools and citizens' trust in the government. This survey was uploaded on Kobo Toolbox, data generated were processed through the SPSS software, and generalisations were derived.

Since the research focused on performance and service delivery through ICTs in 2 critical government departments, therefore the site selections were made keeping in view these service-providing departments. Two major districts of Khyber Pakhtunkhwa, including Peshawar and Abbottabad districts were chosen for data collection. In education, a total of 8 institutions representing secondary and higher secondary (4) and college education (4) were selected from Peshawar and Abbottabad which had the highest enrolments of students. Out of each set of 4 institutions, 2 were boys, and 2 represented girls' institutes. Around 25 respondents were chosen from each of the 8 survey sites, bringing the number of total respondents to around 200; around 100 from schools and around the same number from colleges. Systematic random sampling techniques were adopted to select respondents in schools and colleges. The colleges include Government Postgraduate College No.1 (GPGC), Abbottabad; Government Girls Degree College for Women (GCDC), Abbottabad; Government College for Boys (GC), Peshawar; and Government Frontier College for Girls (GFC), Peshawar. The schools include Government Higher Secondary School No. 1 Abbottabad; Government Comprehensive Girls High School (GCGHSS), Abbottabad; Government Shaheed Osama Zafar Centennial Model Higher Secondary School No. 2 Peshawar (GHSS No. 2); and Government Girls Lady Griffith Higher Secondary School (GGHSS), Peshawar.

In health, one tertiary hospital in Peshawar-Lady Reading Hospital Medical Teaching Institute (LRH-MTI) and one in Abbottabad-Ayub Teaching Hospital (ATH-MTI) were chosen because these provide health care services to thousands of patients daily. A total of 100 surveys were conducted: 50 from each hospital site. The survey respondents were primarily either patients or their relatives who accompanied them to hospitals for seeking medical treatment. In the case of hospitals, the convenience sampling method was used following the Mall Intercept Survey Technique to collect data through face-to-face interaction. The enumerators filled in the questionnaires in Kobo Toolbox software uploaded on tablets.

4. THEORETICAL FRAMEWORK

The literature on digital governance outlines two broad approaches for identifying the relationship between technology and society; Technological Determinism and Social Constructivism/ Social determinism (Winner, 1980; Chadwick, 2006; Johnson & Wetmore, 2009). The technological determinists argue that technology is an autonomous and powerful force, which determines society by producing direct and inalterable social changes. In this argument, technology follows a linear path of progression, uninfluenced and unrestrained by social and political forces, and compels people and institutions to behave in certain ways (Johnson & Wetmore, 2009). In the opinion of Langdon Winner, artefacts have political qualities perceived in their specific design, history, use, and arrangement, which in turn establishes patterns of power and authority in society (Winner, 1980). "*The things that we call technologies are ways of building order in our*

world. Many technical devices and systems contain the possibilities for … ordering human activity… technologies influence how people are going to work, communicate, travel, consume, and so forth…" (Winner, 1980, p. 127). The social constructivists, on the other hand, contend that technology does not follow a natural or logical order of progression, rather it is controlled by man. They maintain that society through interest groups, laws, economy, and political decisions shapes and controls the design, production, and dissemination of technology; even the users of technology interpret and reinterpret technologies by using them for purposes for which they were not designed (Johnson & Wetmore, 2009). To them, there are different ways in which technology and society are interwoven, for example, technology can be used by employers to subvert the autonomy of employees; it can reinforce or break down racial classification; and can be associated with lofty goals like equity, security, and progress (Johnson & Wetmore, 2009).

In another line of argument, Andrew Chadwick contends that sticking to any of the two assumptions or approaches is problematic. He asserts that it is too convenient to assume that the effects of technology on society can be understood just by examining its innate properties. Similarly, it is equally problematic to assume that features of technology have no bearing on how it may be used politically. A more balanced position would be to recognise that technologies have political properties, simultaneously placing their use in the political context (Chadwick, 2006). He examines the influence of communication technologies on power, citizen participation, political parties, pressure groups, democracy, public bureaucracies, social movements, and internet-enabled citizen activism, as well as discusses the issues of governance, political apathy, surveillance, privacy, and security. He contends that internet technologies are being used by civil society and governments simultaneously to posit their point of view; the flow of information is quick and cheap but is restricted by government surveillance and public apathy (Chadwick, 2006). Like Winner, who believes that some artefacts are inherently political shaping the patterns of power and authority in society, Chadwick understands new communication technologies as 'political artefacts,' which exist in a political context. He assumes that the 'politicisation of the Net' arises from the nature of the technology itself and that it, in part, structures a society's social and political action (Winner, 1980, p. 122; Chadwick, 2006, p. 20).

In the realm of e-governance, Andrew Chadwick and Cristopher May (2003) identify three models of e-interaction between states and citizens. The three heuristic models of interaction include the *Managerial model*, the *Consultative model* and the *Participative model*. The *Managerial model* is characterised by the provision of information to the public more efficiently through the use of ICTs. The *Consultative model* focuses on communication between citizens and the government; particularly, communicating the opinion of citizens to the government directly without involving intermediaries. In the *Participative model*, the citizens are truly active and participate in government affairs. However, this interaction and participation take place through multiple associations, actors, and platforms. Therefore, this is a multi-directional interactive model (Chadwick & May, 2003). By using Chadwick and May's *'Managerial, Consultative or Participative Model of Interaction*,' we can develop an understanding of how far participative the practice of e-governance in Khyber

Pakhtunkhwa is and to what extent it follows the general path of information dissemination alone and discourages an active engagement of citizens in consultation and participation. For example, the facility of citizens' online complaints can hardly be termed 'consultative', as the public may communicate grievances to the department concerned and give feedback on government response to grievance redressal, however, the aspect of citizen's consultation in making and running the different applications remain absent. Therefore, we come to Chadwick and May's argument that democratic interaction is being sidelined by managerialism.

5. TRANSFORMING PUBLIC SERVICE DELIVERY IN EDUCATION AND HEALTH

'Is Technology the Silver Bullet?'

All the official respondents from the two Education Departments of KPESED and KPHED and the Health Department and Directorate General of Health Services underscored the importance of ICTs in the light of the necessities of current times and expressed their confidence in the current provincial government possessing enough enthusiasm and innovation to bring ICT induced changes in service delivery. The major ICT interventions identified in education and health included for education, online admissions, computer labs and smart boards for classroom management, biometric attendances for teachers and students, digitisation of schools and colleges data, dashboard creation to monitor the institutions, NTS computer-based testing for recruitment, e-learning portals, and the system of e-transfers. In health, initiatives include disease surveillance and data generation from the field, online access to pathology reports, biometric attendance for para-medical staff, electronic record systems, or the hospital management information system (HMIS), E-Vaccs, telemedicine departments in hospitals and data generation from hospitals and BHUs through the Independent Monitoring Units.

5.1. ICTs & Efficiency in Service Delivery

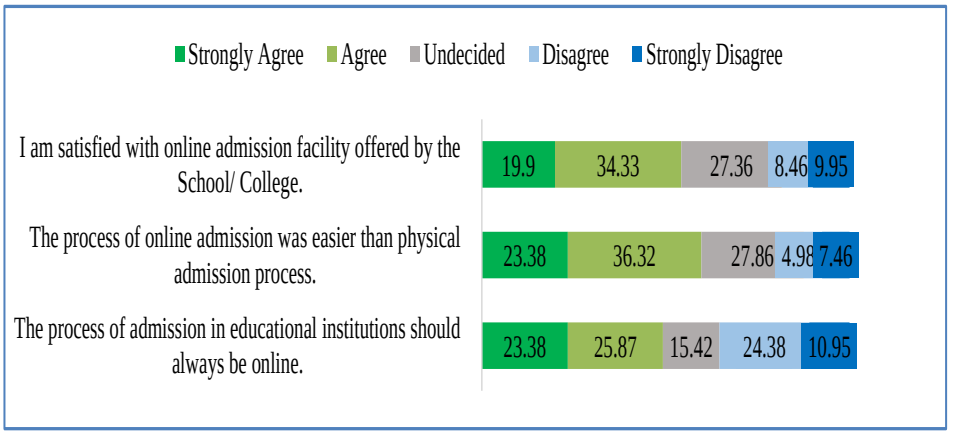
'Efficiency is the Hallmark of Bureaucracy' (Max Weber)

The education and health department officials spoke enthusiastically about ICTs improving the efficiency of service generation. In education, it was argued that ICTs improved the standard of education in government schools, with some designating the digitisation programme as primarily an 'efficiency programme'. They argued ICTs to be 'good management tools' which allowed them to continue official correspondence and coordination in off timings too. Since human interventions in official working had been reduced and human discretion could, therefore, be avoided in official businesses (KPE&SED and KPHED officials). This ensured quick disposal of work. The officials saw digitisation as improving the efficiency of their department's functioning in terms of time-saving and speedy disposal of work. One example here was the HEMIS in the HED, which was established in 2005 had automated all official correspondence for rapid information flow and timely decision making; it also stored all information regarding colleges, including the staff, and is

tasked with the completion of a file tracking system (KPHED officials). However, there was also the backup of all the information on paper. In the context of a well-developed Learning and Management System (LMS), for increasing student-teacher e-learning and interaction capacities and online classes, especially in the pandemic times through Zoom and Google Meet, it came to light that the system was not well developed enough to enable college teachers to upload presentations, etc., for students access; or manage attendance of students online, reflected on a dashboard; however, tenders for a well-developed LMS system were reportedly underway. Other ICT initiatives praised by the officials for improving public sector education provision included the smart board technology in schools, the computer labs and IT experts in schools and colleges, the appointment of schoolteachers through computer-based NTS tests, teachers' online training, digital learning portals for schools, biometric attendance for teachers and online admissions for colleges (Education Department Officials).

If we look at the efficiency-related claims of the education department officials and try to compare them with the responses from the end users, we realise that survey results indicate some digital interventions to be incredibly popular, probably because they are now mandatory, for example, the online admission system for colleges. Around 55 percent students showed their satisfaction and 60 percent thought it to be easier than physical admission (Figure1).

Fig. 1. Student's Satisfaction Level with Online Admission System



Similarly, other steps such as computer education in schools and colleges elicited a higher response of around 58 percent as receiving some computer exposure in schools and colleges. The computer skills learned in these classes included MS Word (44 percent), MS Excel (22 percent), and computer programming (16 percent) (Figure 2). However, an alarming number of students (41.29 percent) stated that they learned no skills, which suggests a less meaningful exposure to computer literacy in schools and colleges. Additionally, only around 50 percent expressed satisfaction with the infrastructure in computer labs (Figure 3).

Fig. 2. Student's Response to Skills Gained from Computer Classes

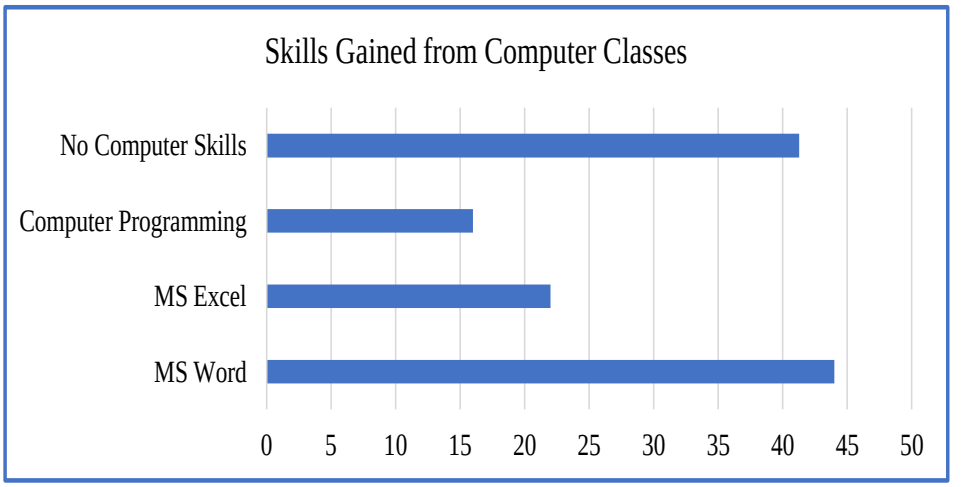
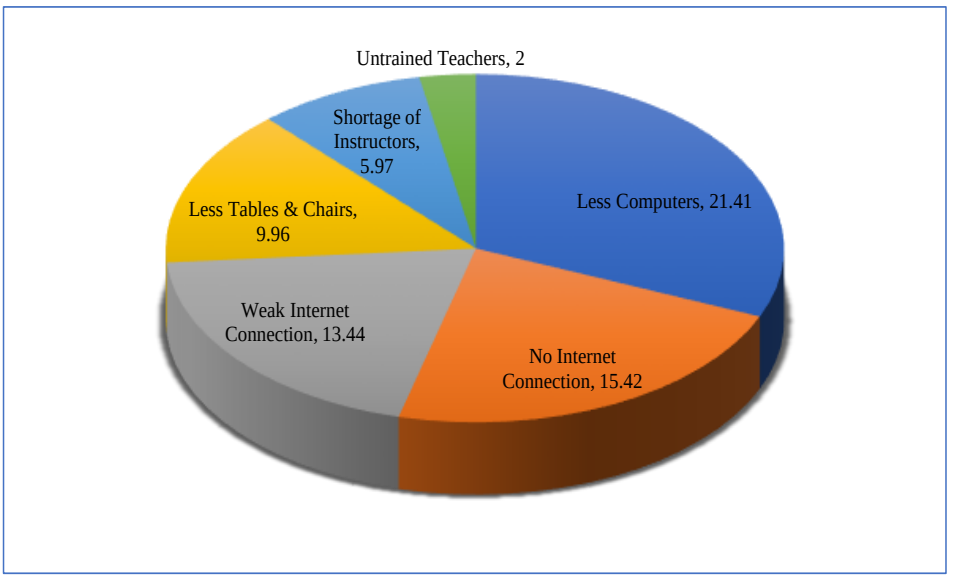


Fig. 3. Deficiencies in the IT Lab Pointed Out by Students



For most other digital interventions, unfortunately, the survey response from the end users was not very encouraging, for example, in the case of smart boards, a staggering 80 percent of students said they were not taught regularly on them (Figure 4) and a majority of 55 percent also showed a likeness for conventional white boards for learning purposes (Figure 5). This is despite the great emphasis from officials, it was also reported from other sources that around 70 percent of smart boards installed in schools were not being used by the teachers; the reason being a limited two-day training could not give them enough expertise or enthusiasm to handle such boards for undertaking successful teaching (Ashfaq, 2016).

Fig. 4. Smart Boards and Student Learning

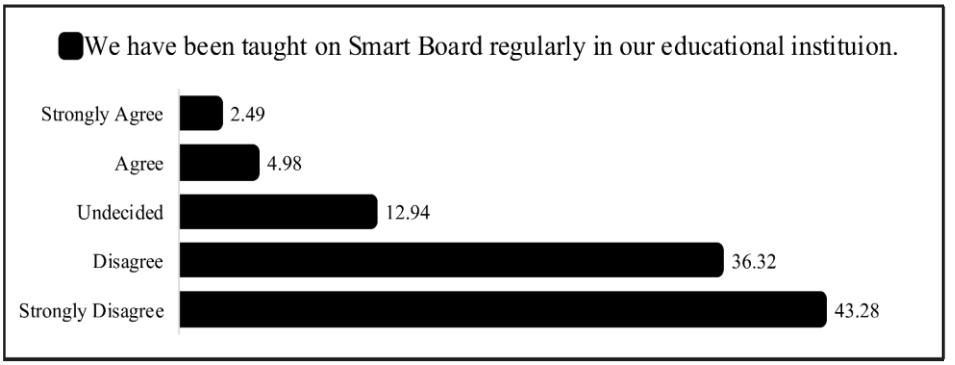
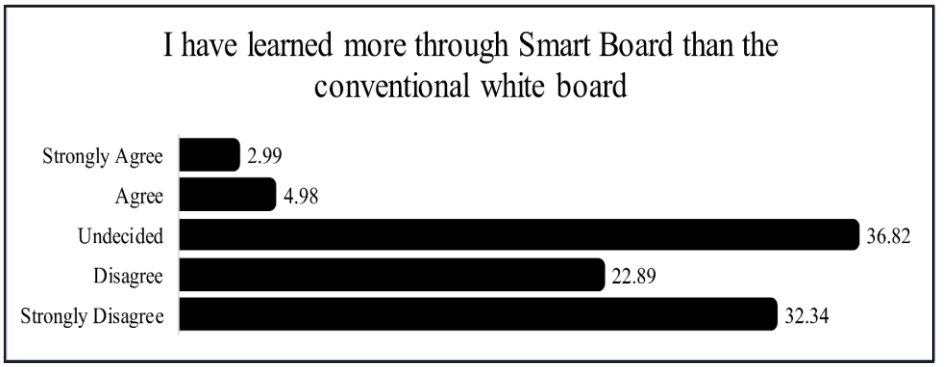
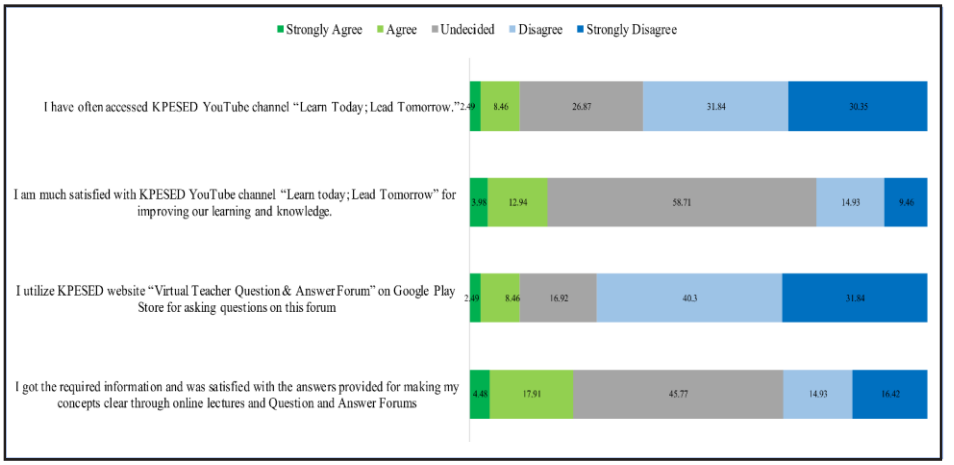


Fig. 5. Student's Survey Response to Smart Board and Learning



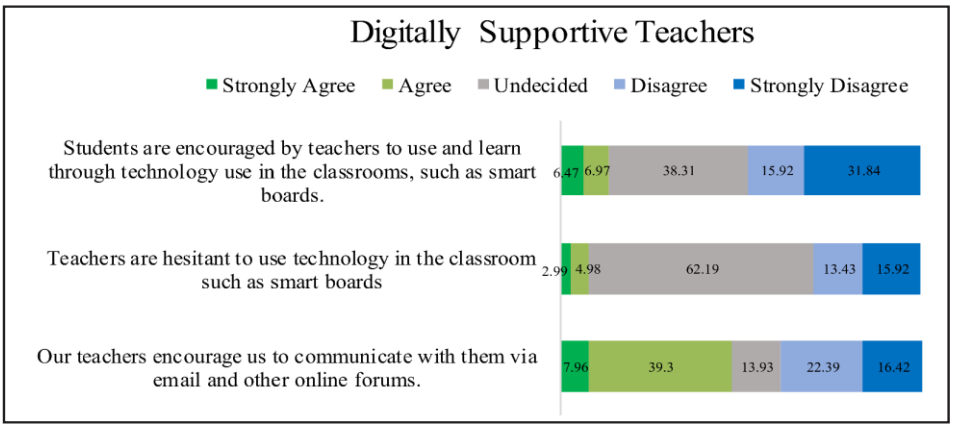
Another dismal performance area is that of digital learning platforms. The results of the surveys show that there was a lack of awareness about online digital e-education programmes among most students (see Figure 6).

Fig. 6. Students' Response to Digital Learning Programmes



It is the entwined forces of teachers, students, and the school environment that can help produce digitally supportive schools and colleges. However, if the teachers are hesitant to use technology in the classroom (such as smart boards), then the students will also lack the confidence to use technology. A large percentage of students (62 percent) remained undecided over their teacher's reluctance to use technology (Figure 7). This is probably because around the same number earlier did not have exposure to smart board teaching technology.

Fig. 7. Student's Response on Whether the Teachers were Digitally Supportive or Not



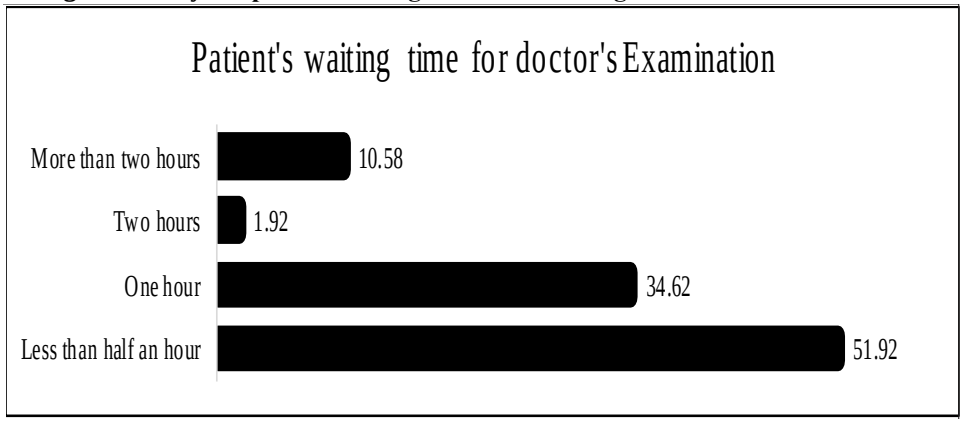
In the realm of health services generation too, digitisation was argued to have brought greater efficiency in the working of the hospitals and the health department's response to disease emergencies. The bureaucracy reported the use of real-time data on Covid through the ICTs speeded up the process of decision-making in the health department. Efficiency is also seen in the timely and effective response to disease outbreaks by the government. Here the officials made comparisons with the earlier manual data entry practice and the resultant belated government response. The ICTs helped identify health emergencies due to real-time data reporting; made mandatory for doctors to report within 24 hours of the spread of different infectious diseases. Digitisation saved the costs incurred on X-RayY printing and multiple visits in case of non-accurate scanning, saving patients from harmful radiation exposure. Similarly, the radiology report as soon as it goes through a C.T. scan can be viewed by the consultants; thus, time wastage is avoided. Only X-Rays were not directly uploaded, only when required, which again saves time and film costs; this also ensured the element of accuracy and digital X-Rays could also be zoomed in on the screen to help reach a correct diagnosis.

The IT officials in hospitals reported productivity of teamwork improved especially in public sector hospitals as a result of IT interventions. The DHIS official also informed us about making key performance indicators to measure the efficiency of different hospitals in the province; these performance indicators displayed on the dashboard could be monitored to understand how hospitals were performing. However, reservations were expressed about the electronic monitoring system of diseases (primarily

run by the Health Department) for not being very successful due to the wastage of resources on separate reporting and indicators of different diseases, which necessitated the appointment of multiple programme coordinators (Health Department Officials). There was also stress that such efficiency is generated when there is effective monitoring and reporting on ICT tools usage and the tendency to reprimand and punish those who are not effectively utilising the same (Health Department Officials)

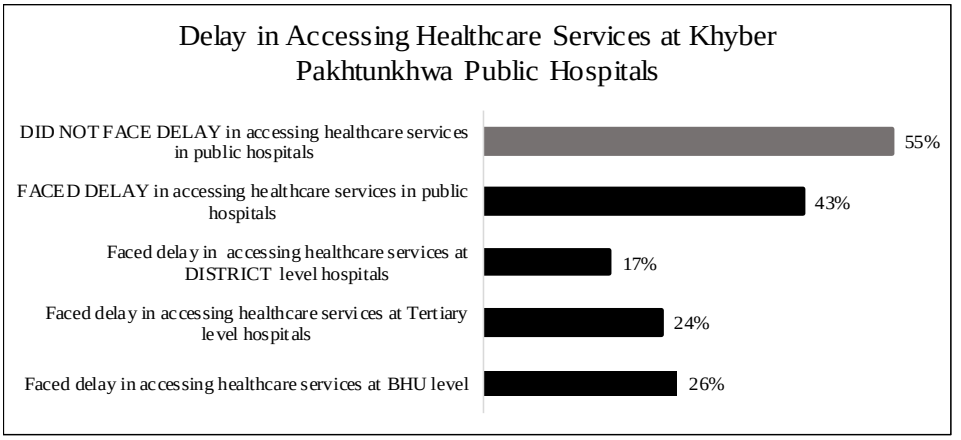
The IT tools reportedly were making health service generation in hospitals faster. However, despite the promise of efficiency, the survey results from end users show that, on average, 48 percent of the patients had to wait for an hour or more to be examined by the doctor after taking the slip (*parchi*) for OPD services (see Figure 8).

Fig. 8. Survey Response Showing Patient's Waiting for Doctor's Examination



When patients were asked if they faced a delay in accessing healthcare services in the Khyber Pakhtunkhwa public hospitals, around 43 percent reported that they faced a delay of some sort in accessing healthcare services at different levels of government healthcare facilities (Figure 9).

Fig. 9. Patients' Response to Delays Faced in Accessing Healthcare Services in Public Hospitals in Khyber Pakhtunkhwa



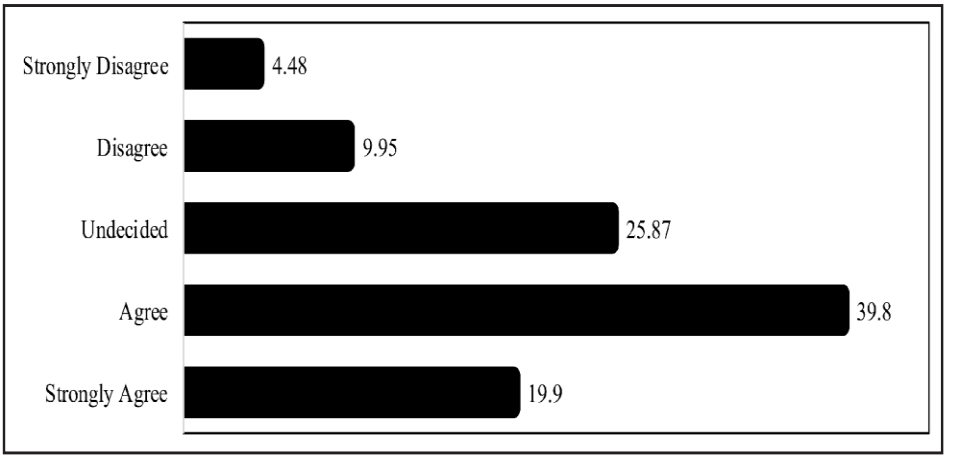
5.2. ICTs and Transparency in Service Generation

Access to information and transparency is one of the themes of digital government and researchers agree that in the information society of today, governance involves critical aspects of how information is collected, analysed, used, and disseminated (Dawes, 2009; Scholl, 2006 & 2014). Internet portals of the government institutions help reduce perceptions of corruption against the government and its institutions (Garcia-Murillo, 2013) and government institutions' strong web presence also ensures transparency and citizen participation (Jones, 2011). In the realm of transparency and accessibility to data in education as well as health, most of the data and information available on the KPHED as well as the KPESED website is outdated, dating back several years, which shows a clear failure to provide up-to-date information to the citizens frequently. This is also true for the health department as well as the teaching hospitals and other levels of hospitals and BHUs lacking well-developed and interactive websites with related information.

In the realm of transparency in education, one of the most recently introduced (September 2021) digital interventions is that of 'e-transfers;' with claims to 'revolutionise teacher transfers,' pave the way for quality learning, and ensure zero political interference in postings and transfers of school and college teachers. It is also publicised as a grievance redressal mechanism for teachers to submit their grievances online (KPESE Department GoKP, n.d.). The officials from education talked in length about the biometric attendance system for teachers introduced in around 288 colleges (out of 313) and around 60-70 percent of the schools. All education offices including DEO offices in districts also reportedly had bio-metric attendance systems. Official interviews confirmed that biometric attendance in schools brought down teacher absenteeism; teacher attendance improved by 95 percent. DEO's regular school visits are uploaded and ranked on District Performance Evaluation Scorecard monitored by the respective secretary and chief secretary. Resultantly, teachers' punctuality improved as a result of reporting real-time data to the DEOs office. Similarly, the employment of school teachers through computer-based National Testing Service (NTS) tests for recruitment in government schools, not only supports the use of technology for employment but also makes the process transparent. The NTS system was claimed by officials to be 100 percent transparent, also bringing political interference down to zero (Education Department Officials).

However, a monthly government report from January 2020, declared the performance of teachers, students, and relevant staff in Khyber Pakhtunkhwa's 347 higher secondary schools as well as in district education offices as unsatisfactory and used the term '*very discouraging'* for teachers in some schools of district Peshawar, as well as other districts. It was reported that the teachers remained absent from duty after registering their bio-metric attendance (Yousafzai, 2020). The survey results show that the majority of the students (60 percent) believe the biometric attendance of the teachers helped solve the issue of teacher absenteeism. However, a small number of students (26 percent) were not sure. Add to it those who disagree, and we have around 40 percent of students who think otherwise (Figure 10).

Fig. 10. Biometric Attendance of Teachers and Improvement in Teacher Absenteeism

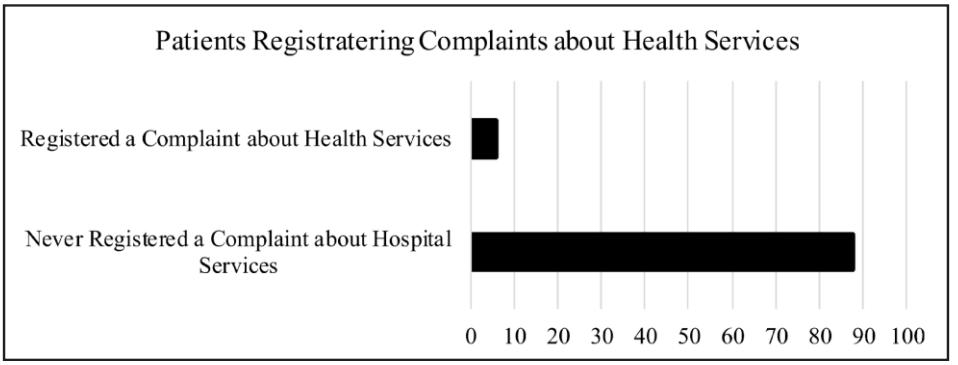


The results generated from the survey further show that a clear majority of 71.15 percent of students responded as being unaware of any online feedback system for evaluating teacher's performance, nor had they ever given their feedback on teacher's appraisal. Similarly, students also expressed that they were not allowed to give their feedback on the school/college administration performance either (83.58 percent).

In the domain of digital health and transparency, the officials reported that ICTs were not only improving the quality of health care but also speeding up the process of catching leakages within the health system. The biometric attendance of doctors and paramedics was ensuring their timely presence in hospitals. There was the added aspect of service generation becoming more transparent and accountable in hospitals. The IT director of LRH reported that the patient's test result as well as treatment was now time-bound electronically. The X-ray results getting mixed up (this happened in the manual system) was also put to rest with the digital X-ray machine. The system of bar-code which is machine-readable, avoided such errors, resolving issues of 'health data manipulation.' The diagnosis also being more accurate as digital X-rays could now be evaluated by the doctor from close angles through the facility of zooming in. The digitisation of patient record underway in the medical record numbers (MRN) system, will help the government to hold the local BHU responsible for not treating the local patients for simple ailments and forwarding them to big hospitals in cities.

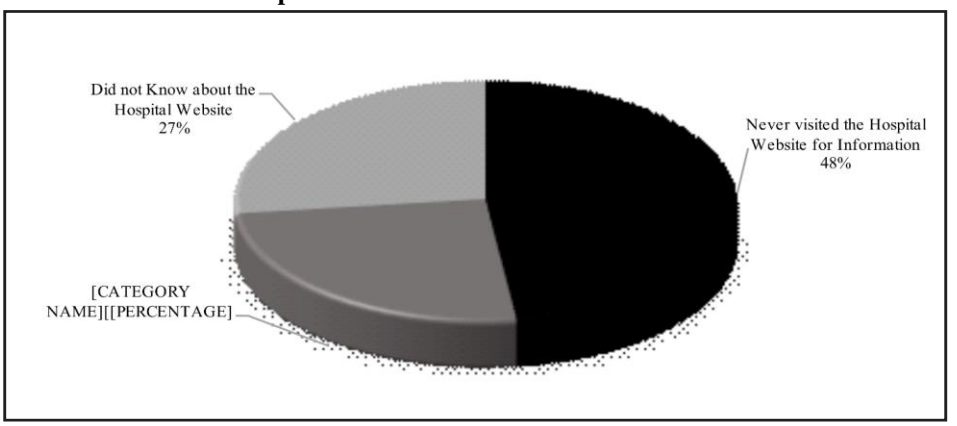
The public tertiary hospitals also ran an online complaint system for patients to record their grievances. However, quantitative survey results indicate that none of the patients accessed the online complaint registration system of the hospitals. The survey respondents when asked if they ever had registered a complaint about the hospital services, 87 percent of the respondents stated that they never had lodged a complaint about the hospital services. The 5.77 percent who had registered their complaints had done so by writing to the hospital administration (see Figure 11).

Fig. 11. Complaint Registration about Health Services



Even though both the LRH and the ATH hospitals had adequate website presence, which provided ample information about the hospital services, the doctors available in each ward, the number of departments, staff, beds, the OPD timings, *Sehat* Card Plus services, online doctor's appointment (only in LRH MTI, Peshawar), information about different lab tests and reports available, etc., still, 48 percent of the respondents had never visited the hospital website for any sort of information. Around 26.92 percent remained undecided implying they did not know about the existence of any hospital website (see Figure 12).

Fig. 12. Survey Results Showing the Percentage of Patients Visiting the Hospital Website



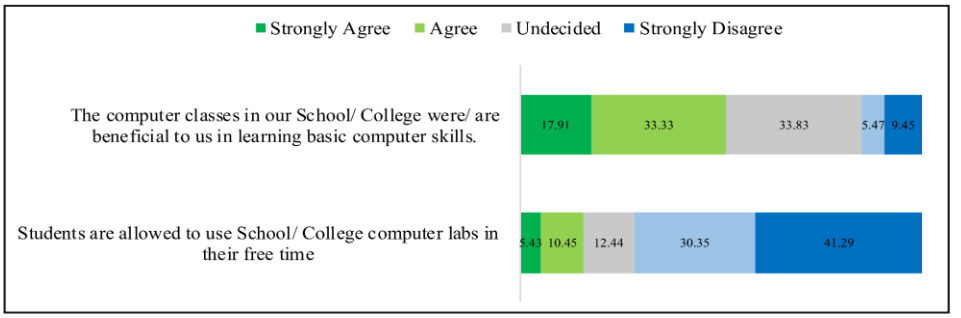
5.3. ICTs and Accessibility in Service Generation

Inclusivity through e-education was linked with infrastructure facilities available in schools and colleges and the financial resources available to the parents. The education department officials argued that e-education programmes can improve the quality of education for all only when it is accessible to children. An important aspect of inclusivity was that mostly underprivileged children were studying in public sector schools, which meant that they lacked the resources to afford digital gadgets for utilising online sources of knowledge. Inclusivity is also hindered by around 30 to 40 percent of the secondary

and higher secondary schools lacking any computer labs and smart boards. The situation for the middle schools is not very encouraging. A 2019 Express Tribune report cites 8,000 middle schools in Khyber Pakhtunkhwa not possessing any IT lab, or IT teachers, despite computers being one of the 9 core subjects there. This meant around 100,000 students in such schools faced such shortages (Haroon, 2019).

The survey results on accessibility to computer classes show that a majority (58 percent) conceded to receiving some sort of computer classes at their schools and colleges. Among the group who received computer education, a majority (51.24 percent) agreed that the computer classes they received in their schools/colleges were beneficial to them in learning basic computer skills. However, around 34 percent of the students were undecided on the benefits of computer classes and a small number (14.92 percent) thought computer classes to be ineffectual (see Figure 13). An alarming revelation was that a considerable percentage of students (42 percent) had never received any kind of computer education at all.

Fig. 13. Computer Classes and Student's Accessibility Issues



When students were asked in the survey if they were allowed to use school/college computer labs in their free time, a majority (71.64 percent) responded in negative and 12.44 percent were unclear whether their school/college would allow them to use the computer labs when they needed to use it. This shows that our schools/ colleges are quite far away from being 'digitally supportive,' a concept introduced by Wastiau, et al. (2013) who argued that state-of-the-art ICT structures along with the opportunity to access it were imperative to help improve digital competencies among students and ensure 'digitally confident students.'

Inside the schools too, certain policies hamper the accessibility of students to computer education. For example, as suggested by interview respondents, students were exposed to computer literacy from grade 6 (middle schooling) and onwards. On further query, it was revealed that computer science was not compulsory but an optional one left to the choice of students to choose from among Arabic, Pashto, and other languages**.** The officials informed that hardly 15 to 20 percent of children in public sector schools could benefit from digital education initiatives as a majority of the students came from poor families. A look at the graph (Figure 14), shows the income disparities of children studying in public sector schools and colleges, which in turn leads to disparities in accessing digital devices and tools (Figure 15). The officials rightly argued that unless the end users, i.e., the students in public sector colleges and universities are not facilitated

with the provision of cheap internet packages, mobiles, and laptop devices, the students will fall behind in education as compared to the private schools and college students. In a survey done by the HEMIS in colleges to gauge the level of preparedness of students in Khyber Pakhtunkhwa for online classes (availability of 3G 4G services, laptops, etc.), it was revealed that only 5 percent could confirm the availability of these facilities.

Fig. 14. Average Family/ Guardian Income of Students Studying in Khyber Pakhtunkhwa Government Schools and Colleges

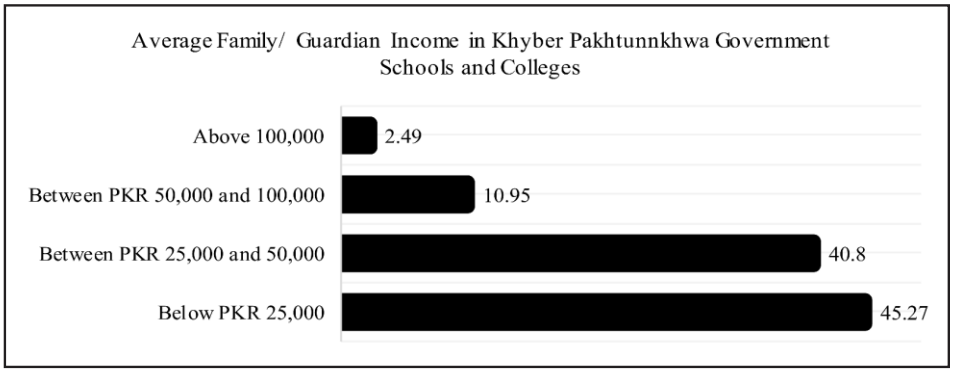
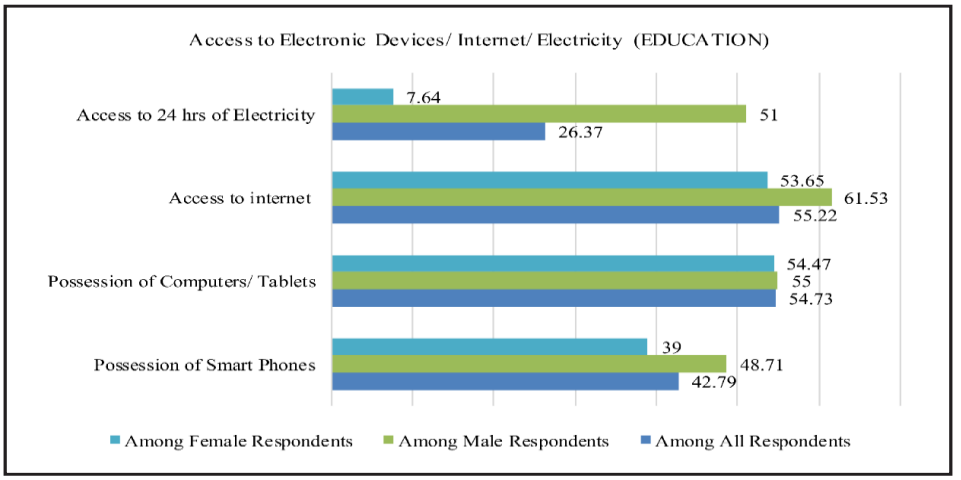


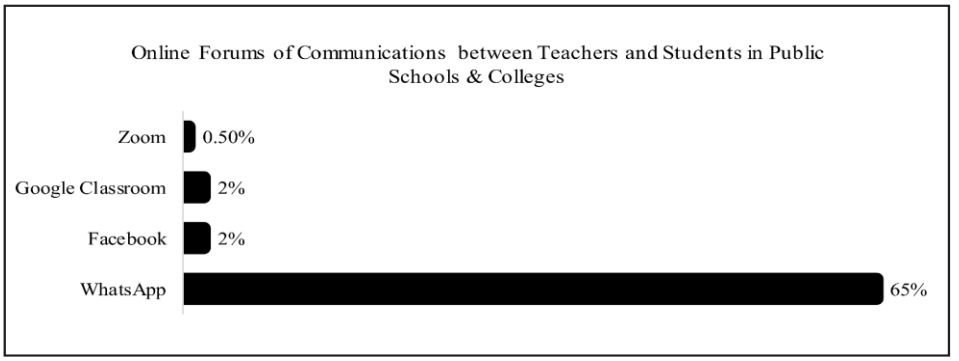
Fig. 15. Access to Electronic Devices/ Internet/ Electricity (Students in KP Higher Secondary Schools & Colleges – Peshawar & Abbottabad



As opposed to the west, where the social structure is there to support digital transformation, Pakistan not only lags in social structures conducive to digital transformation, but the use of the internet and information and communication technologies is also somewhat abstruse. The access of the majority of students in Khyber Pakhtunkhwa schools and colleges to the internet (55.22 percent), as shown by the survey data, displays the fast diffusion of internet among the Generation Z (Figure 15). However, this increasing internet penetration does not promise transformation in the real sense, and neither does it closes the gap of the digital divide among the different social

groups. The females have even lesser access to digital devices and internet connections. The accessibility issues are correlated with the use of online forums by students to communicate with their teachers. The majority of the students (64 percent) agreed to have used some form of an online forum to communicate with their teachers and the most widely used was WhatsApp (65 percent) (Figure 16). However, around 34 percent of the students had never used any online means to access their teachers. This is despite around 43 percent possessing smartphones and 55 percent having either computers or tablets.

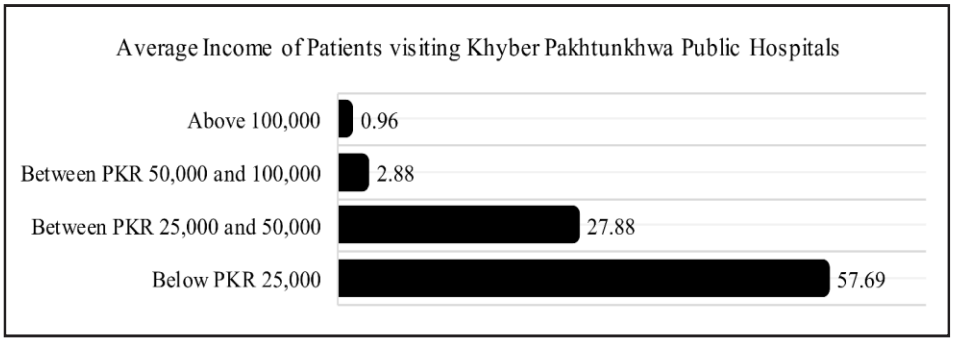
Fig. 16. Online Forums of Communications Between Teachers and Students in Public Schools and Colleges



The overarching dependence of teachers and students on WhatsApp to deliver lectures and communicate shows the low level of teachers' and students' confidence in their digital competencies and the inability to use more formal means of communication and lecture-delivering forums such as Zoom, Google Classroom, etc. It also indicates the incapacity of the school/ college strategies to support ICT integration in teaching and learning that was promised by the education department officials through the introduction of the LMS in schools and colleges.

In digital health and accessibility, officials argued that the very fact that the government charged just Rs. 20 as token money for OPD services in public hospitals is a pro-poor policy that increased poor patients' accessibility to these hospitals. The quantitative survey analysis brings home the point that the public hospitals are visited by mostly very poor patients with a majority (57.69 percent) having an average income of less than Rs. 25,000 (see Figure 17)

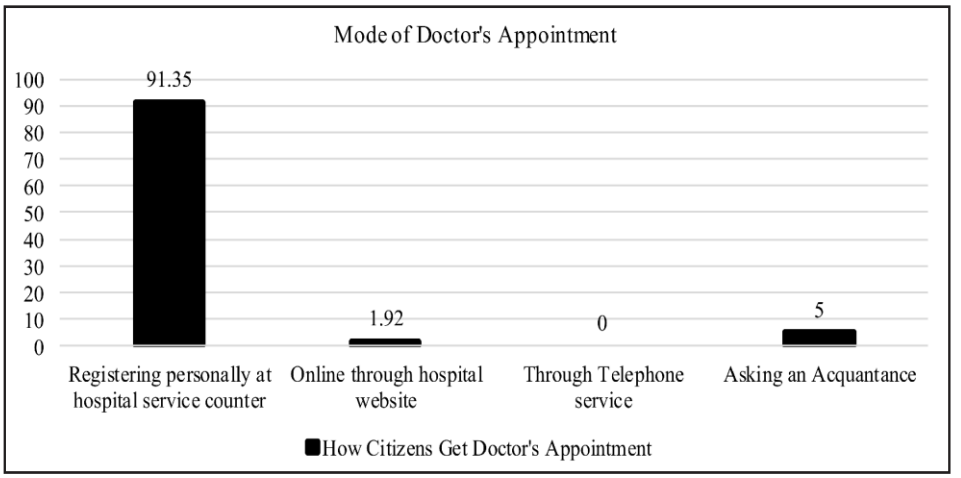
Fig. 17. Average Income of Patients Visiting Khyber Pakhtunkhwa Government Public Hospitals



Accessibility (in terms of expenses) of poor patients was further increased with the lower cost of tests, resulting from the digitisation of films in radiology. The inclusivity issue was somewhat addressed through the government's '*Sehat Sahulat Card'* that made health care affordable for patients by providing support to health care expenses of patients in hospitals that were near to their places, which also prevented overcrowding in main hospitals in cities. According to officials, health care was becoming more inclusive and accessible through online services, such as online doctor appointment facilities and patient access to medical data online**.** It was revealed that the patient had only access to his pathology reports, which he could download at his convenience in his home (Health Department Officials).

However, the patient's use of ICT tools for health services was hampered by traditional ways of accessing health care services. The patients, as argued by the health officials, still preferred to access health care in public sector hospitals physically, because of the existing culture of in-person visits to hospitals and because of their low educational levels, which hampered knowledge of and usage of ICT tools. The survey outcomes also showed that the majority of patients accessed the doctors through forums other than online. This was also because the online doctor's appointment option on the hospital website is meant for the inpatient department (IPD) and it was not functioning for OPDs conducted in the morning. The online appointment system is available only for the Institutional Based Practice (IBP) of doctors under the Khyber Pakhtunkhwa Government Medical Teaching Institutions (MTI) Reforms Act 2015. When asked about the mode of getting doctor's appointments, a considerably high majority (91.35 percent) stated that they do not get doctor's appointments either online or through telephone service, instead they preferred to go to the hospital and register personally through '*parchi'* in hospital OPDs (see Figure 18).

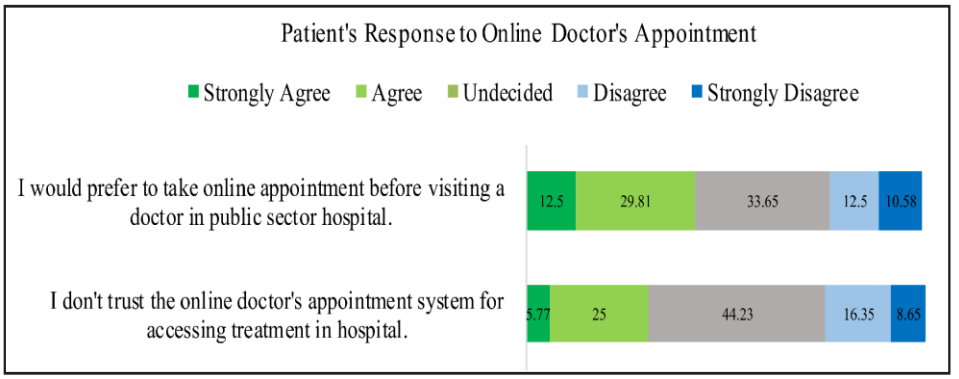
Fig. 18. Mode of Doctor's Appointment



The issue of doctor's online appointments is an important part of a hospital's online presence. Survey results showed that 30.77 percent did not trust the online doctor's appointment system for accessing treatment in a hospital, and most respondents

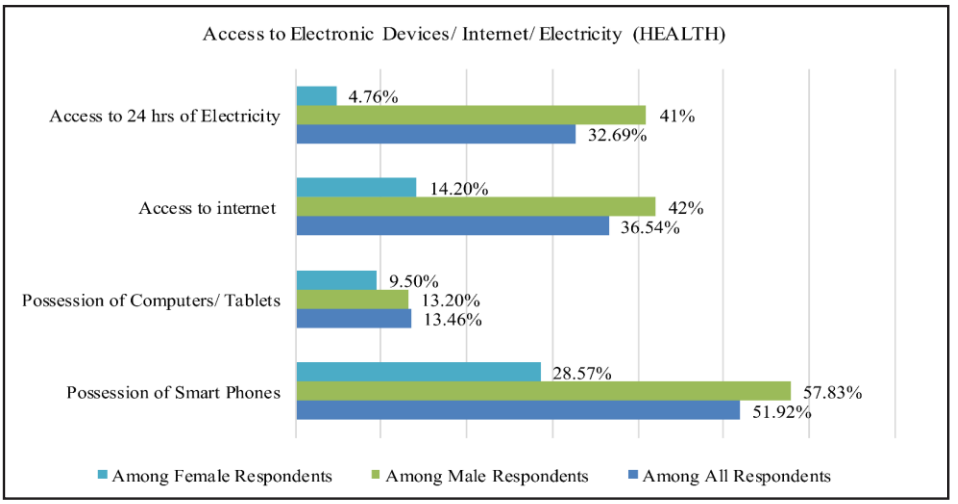
(44.23 percent) were undecided and could not make up their minds as to trust the system of online appointment or not. Only around 25 percent of the respondents showed their trust in the online doctor's appointment system (Figure 19).

Fig. 19. Survey Response to Online Doctor's Appointment



The survey showed interesting results on the issue of online access to medical reports. Most of the respondents (46.15 percent) were undecided on whether the public hospital should provide them online access to their medical records, including test reports. However, 44.23 percent of the respondents reported that they would like the hospital to provide them with online access to their medical records and test reports. For inclusivity and marginalised population's coverage in health, there was optimism among officials that ICTs can achieve these goals provided the local BHUs are equipped with proper infrastructure and internet availability was ensured to connect patients with hospital consultants. On the end user's side, the accessibility issue was hampered by citizens' access to electronic devices, internet facilities, and electricity (see Figure 20).

Fig. 20. Survey Outcome Showing Patient's Access Levels



6. ISSUES HINDERING E-GOVERNMENT EFFORTS IN EDUCATION AND HEALTH

There is hesitancy, skepticism, and latent resistance among the bureaucrats about the digitization initiatives and related impacts. For example, some believe online education cannot be a replacement for interpersonal and face-to-face teaching. Others display overt technological shyness by arguing, "*... personally I think people do not like the use of ICT tools*." Still, others contend, "*it is not an easy job…it involves many factors…it is not just technological change, but also a behavioural one*." Some also give the example of e-office to argue that technology was ineffective because of its *"complicated nature" ... "You will have to scan documents and then officials would write on them and then it would go to the other higher official in a long chain but writing comments on such files is a complicated business."* Therefore, a lack of skills was indicated to be the main concern. Officials also lamented the fact that most people who were oblivious to the potential and importance of ICTs were occupying the strategic policy-making level posts inside the government. In health too, though high levels of enthusiasm were reported for ICT tools among the service providers, however, change management issues were also reported. For example, hesitancy on the part of hospital staff in using computers, which was reportedly being overcome through regular IT training. Some officials admitted that the e-file system was not running very effectively in the education department, because of the clerical staff's unfamiliarity with the system. This was probably because the in-service training for these clerical staff was not properly managed. The organisational culture in schools was reportedly changing due to repeated teacher training imparted to teachers in schools where smart boards and computer labs were introduced. *"... the teachers are no longer afraid of using ICT tools in teaching. People's expertise with the software is improving…"* said one official. The NTS-based appointments and higher levels of education among teachers were also helping to reduce technological shyness.

Some of the officials linked change management issues in education to the ICT savviness of their secretary-level bosses, giving examples of how some of them through persistent direction and monitoring were adamant about making the ICT interventions a success. A few also argued that there is less bureaucratic hesitancy for such ICT initiatives that do not involve drastic policy changes. Officials also mentioned technical issues and glitches resulting from the first-time usage of ICTs to conduct official business, such as online meetings during Covid 19 emergency; to quote one official, "*I haven't attended even a single online meeting that did not run into problem*s." In health too, technical glitches were reported to be impacting the systematic entering and use of data in some cases. Issues with internet connectivity at local levels also delayed the process. The context of outdated machines which did not support ICT initiatives in health was also pointed out as one aspect of the problem. The deficiency of technical staff, especially data entry operators (DEOs)' at district-level BHUs was also reported. Despite resistance to ICTs, a technology culture was being developed in some areas because of the mandatory nature of work, such as the district education officials (DEOs) must regularly log in and report to their bosses and in case of non-communication, are reprimanded. Similarly, the case of e-transfers shows that since there is no alternate way of registering transfer cases for school and college teachers except online; therefore, it

has now become mandatory. The same stands true in the case of mandatory online college admissions in Khyber Pakhtunkhwa.

In the case of financial obstacles, there was some hesitation on the part of top-level bureaucrats to admit the lack of resources from the government side. However, we can assume that they did not want to annoy their political bosses by issuing such statements that could be traced back to them. Others who were serving in the middle and lower cadre of bureaucracy were more open to the fact that ICTs could improve service delivery further provided more resources were made available. Some officials downplayed the lack of resources aspect to emphasise the lack of vision of policymakers, which results in a waste of money. In health, lack of finances was argued as a long-standing issue which meant the government always provided finances less than the demand, although some argued investment was undertaken in critical e-health fields. Shortage of funds made the government take recourse to donor funding; such programmes initiated by the government and run by the donors initially for 5 to 6 years are reverted to the government and got 'political ownership,' once it generates a demand among the people. For provincial government spending on education in the last five years, see Table 2.

Table 2

The Khyber Pakhtunkhwa Government Expenditure on Education (2015-2020)

Years	Total Expenditure
2015-16	112,231
2016-17	136,121
2017-18	142,643
2018-19	152,711
2019-20	46,249

Source: Pakistan Economic Survey 2020-21. Government of Pakistan, Finance Division. Page 206. Retrieved December 2021 from https://www.finance.gov.pk/survey_2021.html

The provincial government websites are not interactive as far as the public is concerned. A website may serve multidimensional purposes. However, the Khyber Pakhtunkhwa government websites are focused on information sharing or policy presentation and service delivery. Many of these are not fully modernised; the outdated data on the websites provide little information to citizens. Some websites do show proactive disclosure of budget estimates (such as the ST&IT department) but mostly it is not current or contains information on the remunerations of the officials only. Similarly, attempts to avail the services portal links show errors or the contents don't get displayed. The use of websites as a deliberative or co-production channel (Lee-Geiller & Lee, 2019) is, therefore, overlooked. Citizens passively receive information or services but are denied feedback mechanisms, resultantly, the consultative feature of the websites is ignored. The primitive nature of government websites is further impaired by the poor internet services in Khyber Pakhtunkhwa.

The e-government initiatives make use of ICT tools and applications, which necessitates the availability of high-speed internet and access to mobile devices by the public for effective utilisation of public services. Given the fact that the majority of the Khyber Pakhtunkhwa population (83.1 percent) lives in the rural areas and a quarter (16.9

percent) in the urban areas (PBS, GoP, 2017), only around 15.1 percent of the rural population has access to internet connection and 41.9 percent urban residents have internet availability (ASER, 2019). The survey results also underscore the issues of lack of access to mobile devices by the public. In the year 2020, Pakistan imported 24.51 million phones, compared to the locally manufactured capacity of 13.05 million (Arab News, January 25, 2022). Add to it the 'regulatory duties' (between 32 percent to 240 percent) that were imposed by the Federal Board of Revenue (FBR) on the import of mobile phones in 2021 (Rana, July 2, 2021). Additionally, the Government of Pakistan imposed a 17 percent tax on mobile phones in the Supplementary Finance Budget on January 15, 2022. The newly imposed tax led to a price hike of approximately 30 percent above the original price (Digital Rights Monitor, 2022) of these phones, deviating from the government vision of a 'Digital Pakistan.' The non-affordability of cell phones coupled with the non-availability of an internet connection is the key restraint for citizens to utilise online public services. The once-upon-a-time rendition of access to technological devices being a luxury has undergone significant change, especially during the Covid-19 emergency period. 'Digital Pakistan,' therefore, needs 'digital access,' which is only possible with affirmative digital policies that ensure digital access and reduce the digital divide in the country.

7. CONCLUSIONS AND POLICY RECOMMENDATIONS

The Khyber Pakhtunkhwa Government's ICT-driven interventions are promoting values of efficiency, transparency, and inclusiveness in service provision. Efficiency in service delivery in terms of better management of resources, quick delivery of services, and provision of quality services; transparency as openness of government information to the general public; and justice as the value-ethic of government agencies is shown in its principle of inclusivity - the ability to provide services to all regardless of their language, religion, culture, ethnicity, area of habitat, political affiliations and above all their social condition. An in-depth search for reality as to whose interest these ICT technologies serve and who is excluded or included is critical. Just as Kühn (2019) is worried about the dominant narrative in education technology of finding out and implementing universal technological solutions supported by the inventions of Silicon Valley. He calls these narratives deterministic in their approach. This deterministic approach encourages forces other than our free will to govern our behaviour; the Khyber Pakhtunkhwa government's digital policy narrative about its capacity of transforming the government 'apparatuses,' mechanisms and processes, are regulating and supervising our actions/behaviours over which we have no control. Canguilhem 'recognises the logical primacy of the abnormal over the normal' (Pasquinelli, 2015); adopting his stance, one can say that the manual disposition of work by bureaucracy has become 'abnormal' according to the 21st century reinventing government narrative of David Osborne and Ted Gaebler. So, to bring this 'abnormal' to 'normal', digital interventions are necessary. Digitisation hence becomes the new normal; any defiance will be regarded as abnormal. This brings us to what the technological determinists would say that technology compels people and institutions to behave in certain ways (Johnson & Wetmore, 2009).

The findings of our surveys and interviews suggest that a managerial model of e-service delivery prevails in Khyber Pakhtunkhwa, where the citizens are seen as passive

customers and are primarily at the receiving end. Though the ICTs have brought quantitative improvement in previous technologies, however, online citizen participation to avail of these services is largely in the form of a one-sided flow of information to the citizens as their input on the quality of services provided is almost non-existent. Citizens' connectivity with the government is one-sided with information displayed on government websites. Only a few online feedback portals are available, which are almost rarely used. This practice runs against the real aim of digitisation, which is to increase citizen participation, and to make policy making and formulation with citizen's input; however, the findings suggest that there is no input of citizens in policy formulation. It means that the digitisation era is a continuation of the New Public Management Model (NPM), in which the government adopts and applies a business model to deliver services. Service delivery is made synonymous with business relationships; citizens are customers, whom the government must satisfy. Here, the service providers assume the character of businessmen who are trying to gain profit, not necessarily in terms of money but in the form of public support or public trust.

It is not without saying that technology is bringing transformation in the way people access and bureaucracy administers services. For example, college admissions in Khyber Pakhtunkhwa have gone online in the last few years. It has been accepted as mandatory and, therefore, is more prevalent and positively rated, as the survey data suggests a positive review of this app. For other apps and e-services, which are not mandatory, there is less penetration and selective usage by the end-users. Technology's use, therefore, could not become as common as was envisaged in the government policies. We can also argue that connectivity is indispensable for democracy as information and communication technologies are considered to be an essential requisite for freedom- the freedom to participate. As Anthony Wilhelm explains that the ends for which IT is used and people's access to it will determine the influence of technologies in democracy and politics in the real sense (Wilhelm, 2000, p. 149). In line with what William Dutton, argues, *"Digital government can erode or enhance democratic processes … (but) the outcome will be determined by the interaction of policy choices, management strategies, and cultural responses—not by advanced technology alone…"* (Dutton, 1999, p. 193), we can also conclude that digitisation's impact on service delivery is more a function of critical policy choices, change management strategies, and public access to ICT tools.

The digital interventions in Khyber Pakhtunkhwa demonstrate a unilinear flow of information and services from the government to the citizens. The government's emphasis is on service delivery and policy presentation. Care is taken that there is fast and efficient delivery of information and that is also sugar-coated to make it desirable or acceptable to the people. Each department has its slogan, such as '*Badal Raha hey Khyber Pakhtunkhwa'* (Khyber Pakhtunkhwa is changing), 'from pen to pixel', 'policing by technology', and 'technology is our new ideology' to mention some. This brings the provincial government's digital initiatives under the domain of the managerial model of e-governance. Second, bureaucratic change in conduct is not significant. ICT-induced transformations in the bureaucracy's organisational culture have led to resistance and scepticism of the ICT-introduced reforms. Third, digitisation has led to the expansion of government departments, which is an old phenomenon. Several adjacent structures have

sprung up alongside the already existing sections. Expansion in the size of the public sector is seen in the establishment of new departments, sections, units, etc., such as the PMRU, EMA, HMA, EMIS, HMIS, and others. It is expanding the power of the government, although digital transformation is projected as empowering the common man. We may say that it has led to the diversification of the old homogeneous bureaucracy – a new class of bureaucracy with new patterns of conduct, real-time data calculations, new rules, and modus operandi. To sum up, the provincial government's digitisation scheme is still at its take-off stage, and it will require proper investment, a commitment of the policymakers, and the adaptability of the service providers and the end users for making the journey worthwhile.

The following policy implications and recommendations are suggested:

- Much needs to be done to involve citizens in the participatory practices of e-governance, where the citizens are not just involved in utilising digital governance steps for citizen complaints and redressal, but also play their roles in policy formulation and direction. For this to be practical, the IT wings (HEMIS, EMIS and HIS) of both education and health departments must engage citizens in the process of online consultations before an app or digital service is launched. It is important to mention here that such online consultations may be popularised through social media projection.
- It is not without saying that transparency's starting point is the availability of open sources of information, easily accessible to the public on their websites. Therefore, there is an urgent need to update the websites of both the health as well as education departments. This is essential because the websites of both departments contain mostly outdated information or some very basic set of information. Here, the responsibility of updating can be tasked to the department's respective IT wings. For this purpose, data administrators specifically tasked with uploading the current set of information on government websites can be hired and tasked with uploading new information every fortnight.
- Pakistan had by 2016 declared its intention to join the Open Government Initiative and undertake fiscal transparency, however, no major plan has been initiated so far (The World Bank, 2019, p. 79). Therefore, another policy recommendation is that the government, including the Khyber Pakhtunkhwa, must ensure online access to the public about the government's financial statements relating to various expenditures and on various projects. This is imperative in achieving the goal of transparent service delivery.
- There is under-utilisation of service generation apps because of public awareness issues. Therefore, it is recommended that the government should seriously project its new as well as old ICT initiatives on social and print media platforms and educate the public on how such apps may be optimally utilised. The task is attainable through engaging the already available departmental PR and media officials or spokesperson, entrusted with the responsibility of proper projection of digital tools in service delivery. It is also recommended that the concerned departments can hold small seminars and workshops in educational institutions, especially higher secondary schools and colleges to train and

educate the students and teachers about the potential usage and benefits of such apps. Awareness campaigns can also be generated through primary school teachers who are in a better position to motivate and educate their communities on specific benefits to gain from accessing service generation through such apps.

- This brings us to our next policy recommendation for how to bridge the digital divide. There is a serious problem with affordability of digital tools on account of differences in socio-economic backgrounds. Hence, students must be provided with very subsidised microcredits for the purchase of computers and tablets. Pakistani companies can assemble or make basic tablets at low prices for consumption by low-income households aided by the government concessionary tax regime.
- Public sector school children are exposed to computer education from secondary and higher secondary levels, which given the importance of IT learning at an early age is a very late exposure. Computer studies must be introduced in public sector primary and middle schools as a compulsory subject. Even at the secondary and higher secondary level, the computer is an optional subject, which in turn is directly related to the lack of essential infrastructure in all schools. Here, mandatory intervention in making the computer subject compulsory and provision of essential infrastructure at all levels of schools is imperative.
- Agreements with cell phone companies for student packages or teaching packages for school and college teachers is also a desirable step; this has been attempted by the Government of Pakistan in the case of successfully running the online admissions system for colleges; the service was generated with the help of a renowned cell phone company.
- One suggestion is for the Khyber Pakhtunkhwa government to combine the efforts of its various IT-focused departments under one IT ministry and task the same with developing, implementing, and assessing the ICT tools. In its current form, the Khyber Pakhtunkhwa Information Technology Board (KPITB), the Science and Technology & Information Technology department (ST&IT); the Directorate of Science and Technology (DoST); and the Directorate of Information Technology (DoIT) all perform some overlapping set of functions.
- An essential aspect to overcome resistance to ICT usage among the officials is regular on-job IT training. The fact of the matter is that the e-filling system failed to take off in many government departments because of clerical staff and officers' unfamiliarity with it. Such training can be managed by those specialised cells, which either are taking care of HMIS and EMIS systems within the health and education departments or by affiliate institutes that have specific mandates on training, for example, the Directorate of Professional Development in the Education Department. In big MTI hospitals, there are already IT sections functioning and they have reported on providing regular IT training to hospital staff.
- In the field of education, remoteness and accessibility issues hinder student's access to tele-education apps; it is suggested that since the PTV has wider access across all regions of Khyber Pakhtunkhwa, therefore, its services could be

utilised by the KPESED as well as the HED for coordinated efforts at televising quality course contents teaching for school and college students to follow.

- In the realm of digital health, one important aspect missing is e-referrals in hospitals. If the MTI hospitals in major cities want patients to access their local BHUs and district hospitals first, especially for common illnesses, the patients and doctors must be connected digitally with specialists in big hospitals. Since the government has already provided technicians in BHUs with tablets, and there was also planning underway for installing fixed tablets for disease monitoring, the same can also be utilised to connect district hospitals and BHU patients electronically with the consultants and doctors in a tertiary hospital. This will lessen the burden on major hospitals and encourage people to access basic health services in their hometowns.
- Another policy recommendation is that there must be inter-provincial sharing of best practices in ICTs and service delivery. The coordination between these IT departments will also help them learn from shared experiences and avoid failures from any new experimentations in ICT-induced service generation initiatives.
- In Pakistan, there is a lack of mechanisms that could assess the effects of the new technology interventions in the different sectors. There is a need to introduce 'technology assessment' to aid policymakers by providing them with information about the possible impact of new technology and assessing the short and long-term consequences of old technology. Technology assessment is a form of policy research that will provide policymakers with information on policy alternatives.

The primary object of this research project was to explore how the use of information and communication tools (ICT) is affecting efficiency, transparency, and inclusiveness in service delivery by the provincial bureaucracy in Khyber Pakhtunkhwa and making it undergo organisational and cultural changes in the Education and Health Departments. The introduction of Information and Communication Technology (ICT) tools in the governance of Khyber Pakhtunkhwa province has been a unique experience with policy making in this otherwise economically and socially underdeveloped province. The findings of the study suggest that significant digital interventions were made by the provincial government in both the education and health sectors. Pushed further by the Covid 19 emergency, these interventions stemmed from an understanding of generating evidence-based policies derived from data to enhance the efficiency and transparency aspects of service generation. The ICT-induced impacts on service delivery gravitated towards increased efficiency, time, and resource-saving as well as greater transparency and improved accessibility of both the education and health sectors. However, some major issues impaired the sustainability of digital interventions; change management in bureaucracy being one of them, which led to bureaucratic resistance and scepticism of the ICT-introduced reforms. There is underutilisation of the e-initiatives by the end-users in education and health as identified in the survey outcomes. The reasons can be the lack of awareness among citizens about these initiatives, insufficient digital skills to utilise these services and the context of the digital divide as around half of the respondents have no access to digital tools to access services. Hence, the desire for providing efficient, transparent, and inclusive services through ICTs is hampered by many challenges.

The research identifies the different elements that challenge the smooth implementation and sustainability of the ICT projects in Khyber Pakhtunkhwa Health and Education departments are evaluated in the following table (see Table 3).

Table 3

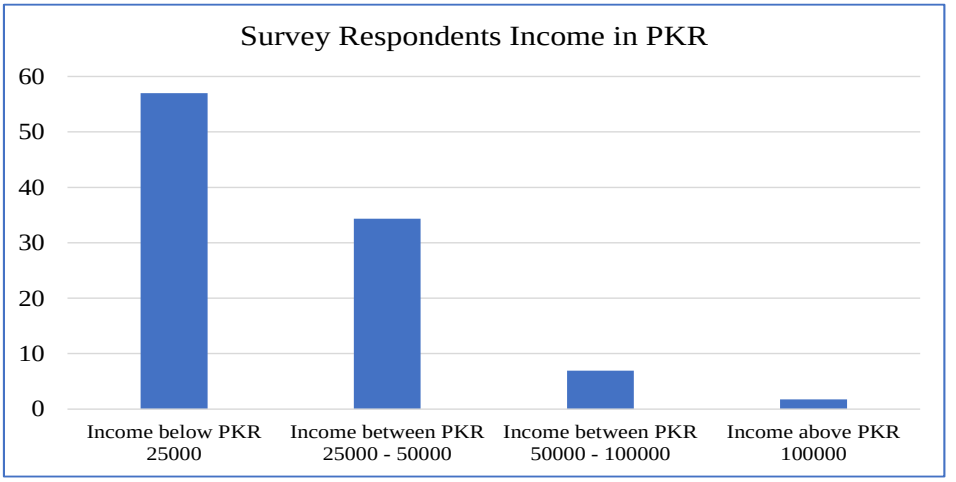
Elements that Influence the Implementation of e-Government Initiatives in Khyber Pakhtunkhwa Health and Education Sectors

Elements	Challenges
Lack of Awareness	Lack of awareness among citizens of the digital initiatives introduced by government to improve service delivery. As a consequence there is underutilisation of the digital services by the citizens which effects the sustainability of a particular project
Technical Glitches	Internet access/ speed/ bandwidth, unstable power supply
Change Management	Government employee resistance to technology in the wake of limited training (e-readiness), less resources, absence of legal framework, ownership issues/ lack of vision among departmental leaders, lack of inter-departmental coordination, no or insufficient sharing of information among ministries.
Lack of Legal Framework	Issues relating to cyber security(data security), digital signatures on files, personal data protection (data privacy), confidentiality, sharing of best practices among provincial departments.
Access Issues and Digital Divide	Lack of access to electronic gadgets especially among females, lack of required digital skills to use digital applications to access services.
Resistance, Cultural Attitudes	End-users insistence to physically access the services by visiting the government offices; the patients reluctance to access their medical data online.
Political Element	Frequent change of high level officials and sustainability of the ICT projects, the government priority, no or low involvement of stakeholders in policy making.
Human Resource	Limited sharing of information (transparency), insufficient or untrained wok force.

The desire for a more efficient, transparent, and inclusive service delivery through ICTs is hampered by the above-mentioned challenges. Citizens' perception of their government's commitment to improving service delivery through the ICTs is rather negatively related to their mistrust of their government in the education sector (survey results). In health, however, citizens have greater trust in the commitment of their government toward efficient service delivery through e-health initiatives. There is underutilisation of the e-initiatives by the end-users in education and health as identified in the survey outcomes. One reason can be the lack of awareness among citizens about

these initiatives, insufficient digital skills to utilise these services and the context of digital divide as around half of the respondents have no access to digital tools to access services. The access issue is further aggravated by their income status, with the majority (57 percent) belonging to low-income groups (See Figure 21).

Fig. 21. Survey Respondents' Income Availing KP Public Sector Health and Education Facilities



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The Perspective of Native People Regarding Developmental Projects of China Pakistan Economic Corridor (CPEC) in Gwadar, Balochistan

ZAHID ALI and NOOR SANAUDDIN

Gwadar's economic potential has become a centre of debate in national and international media. However, less discussed are the people living there, especially the native communities who are mostly dependent on fishing as a source of livelihood. This study has taken a people-centric approach by employing qualitative methods with the aim to explore the perspectives of the native people of Gwadar regarding the impacts of various projects related to the China-Pakistan Economic Corridor (CPEC). Fieldwork was carried out in Gwadar city to collect data from various groups of local people. The findings reveal that the local people had legitimate expectations of improvement in their lives and livelihoods from CPEC projects but, over the last decades, these expectations were not met. As a result, the unmet expectations have given rise to concerns and frustrations. Most of the local people appreciated the development of infrastructure in Gwadar; however, they have been feeling discriminated against and see themselves excluded from the development process. Policy measures have been suggested to make CPEC more meaningful for the local people of Gwadar and to (re)gain their trust and confidence in the government.

Keywords: CPEC, Development, Fishermen, Displacement, Perception, Exclusion

1. INTRODUCTION

The China-Pakistan Economic Corridor (CPEC) is considered to be a 'game-changer' (Qazilbash, 2017; Hamza & Gillani, 2020) for its economic and geostrategic importance for Pakistan and the region. As the flagship component of the "Belt and Road Initiative" (BRI) of China, CPEC is an economic development initiative comprising various components such as transportation corridor, infrastructure construction, industrial development, trade, and livelihood improvement with the aim of socio-economic development, peace, and prosperity for the benefit of the people of the region (Pakistan, 2017). CPEC is expected to bring development, growth, and prosperity directly not only to Pakistan and China, but it will have positive impacts on Iran, Afghanistan, the Central Asian Republics, and the region (CPEC Authority, 2022). As such, there has been a great deal of discussion about CPEC, and its many advantages to Pakistan have been highlighted by experts.

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While CPEC will certainly bring infrastructure developments, economic opportunities, progression, and prosperity to the region, megaprojects usually create inconveniences for local people in the short and well as long run. Local people usually show a mix of reactions to new developments (Kanwal, et al. 2018). While some people see it as an opportunity to be welcomed, some local people of the same area might see a developmental project as a threat to their indigenous livelihood structure, culture, and identity. The recent agitations by local people in Gwadar (Dawn, 2021) are examples of how certain mega projects can create unrest among people. To ensure the smooth execution of CPEC projects, it is imperative for policymakers both in Islamabad and Beijing to take into consideration the important point that effectively managing the expectations and the concerns of the local people are important factors for the success of a megaproject.

The enormous benefits of CPEC to the national economy of Pakistan have been highlighted in the media and as well academic literature in Pakistan. However, not much is available on how CPEC projects will impact the local population in Gwadar, which is considered to be the epicentre of the CPEC (Abbas, 2019; Dawn, 2021; Kanwal, et al. 2018; Saad, et al. 2019). It can also be noted that most academic literature and media have focused on the expected benefits of CPEC to Pakistan at the *national level*, ignoring the *cost* some people at the *local level* might have to pay for these benefits. What are the costs and benefits of CPEC to the local people at Gwadar? What are the fears and expectations of various groups within Gwadar regarding various development projects? How can policymakers better manage the concerns and expectations of the local people for maximising the benefits of CPEC? These and other such questions are the focus of this study.

2. RESEARCH OBJECTIVES

The study aimed to achieve the following objectives.

(1) To explore the knowledge, attitude, and perception of the native people regarding the developmental projects of CPEC in Gwadar.
(2) To analyse the expectations and aspirations of local people regarding the developmental projects of CPEC in Gwadar.
(3) To investigate the concerns and apprehensions of local people regarding the developmental projects of CPEC in Gwadar.
(4) To understand how different groups within the area are affected differently by the developmental projects of CPEC in Gwadar.

3. LITERATURE REVIEW

DeGood (2020) has argued that building infrastructure is an inherently political act and that the design, location, scale, and scope of what governments build reflect social, economic, and political power in society. He has further noted that most often, the benefits of access and opportunity flow to dominant social and industry groups, while the burdens of disinvestment, pollution, and geographic isolation fall on low-income communities. Indigenous populations inhabiting these spaces bear a disproportionate share of the financial, social, and ecological costs of such developmental thinking.

Specifically, large-scale projects change the current spaces and patterns of public social life in manners that nearby native people find problematic, confusing, and threatening (Ferguson, 1999).

The proponents of CPEC in the government and the policy community believe that the completion of the development initiatives under the flagship of CPEC in Gwadar will reduce poverty, solve the energy crisis, and creates business and employment opportunities for the local people (Abid & Ashfaq, 2015). However, Jamali (2014) argued that development in the form of large-scale infrastructure projects can lead to power rearrangements concerning capital, political power, expertise, and knowledge to serve the specific interests of the national and international actors. Similarly, Ufford and Giri (2003) believed that developmental projects bring both gains and pains to society and some people may get the benefits while others may pay for the costs in the process of development.

In recent times, several research studies have elaborated on the advantages of CPEC at the micro-level as well as macro level, but most studies have been theoretical and are not based on empirical data (Saad, et al. 2019). Secondly, for most of the studies concerned with the impact of CPEC on "local" people, the term 'local' means "Pakistanis as a whole." For example, the studies conducted by Kanwal, et al. (2018) and Saad, et al. (2019) on the effects of the CPEC on the *local* people in Pakistan are based on *national* samples of people selected from all over the country. These kinds of studies are valuable, but they fall short of 'localising the context' to the specific groups which are directly affected by various CPEC projects and who constitute the primary stakeholders. Thirdly, most previous studies have highlighted the positive impacts of CPEC on the overall economy of Pakistan, giving little attention to the plight of some segments of people at the grassroots level who might feel alienated and excluded from the development process.

A few studies have already highlighted the plight of local communities in Gwadar who feel that the authorities have failed to listen to their concern. For instance, Ali (2018), Afzal & Naseem (2018), and Esteban (2016) found that while most of the local people will benefit from CPEC projects, some of the local communities in Balochistan have voiced their reservations regarding CPEC projects. Ali (2018) pointed out that the local people in Gwadar are concerned about the increasing securitisation of the city in which the local fishermen are restricted from catching fish in the sea as far as twenty kilometres. Notezai (2021) observed that local people are in a state of anxiety about their future in the city and "if Gwadar's development is not meant to benefit locals first, then it is the first step towards derailing the entire development process." Iftikhar, et al. (2019) argued that there is stress on developing Gwadar as a 'Special Economic Zone' and a 'Smart City' but there is little debate and discussion on making Gwadar an 'inclusive city.'

It is a fact that mega-development projects including dams, railways, seaports, airports, etc. provide significant opportunities for employment, business, and trade to bring prosperity and enhance the socio-economic position and living standards of the people (Abbas, 2019). However, such projects often require large pieces of land for construction and may have impacts and consequences for the locality such as disturbance, displacement, socio-economic problems, and even social and political unrest. Thus, people may be displaced and deprived of their land and lose their socio-cultural aspects of living styles, traditions, social structure, and other economic resources due to mega-

development projects (Oliver-Smith, 2009). It is fairly common and natural that the local people expect to get socio-economic benefits from any development project (Obour, et al. 2016). Suárez & Pérez (2018) argued that if the needs of communities are not ensured in development projects, then conflicts and social unrest intensify in the areas of the affected communities. In initiating any developmental projects, the perspectives of the local population are necessary for building a mutual relationship of trust to extend the work of development.

It might be true that CPEC projects in Gwadar could help revive the aging and dysfunctional infrastructure and the flagging economy of Pakistan. But to deliver on these promises, policymakers need to implement them with considerably more sensitivity and consultation than they have displayed thus far. Given that local acceptance and ownership are a prerequisite for the success of megaprojects and given that the local people in Balochistan in general and in Gwadar, in particular, have shown resentment towards the projects, this study is of utmost importance. While research on CPEC from national, economic, and strategic perspectives is important, research from the local people's perspective is even more significant for a better understanding of the issues and successful implementation of the projects. This study, therefore, has been designed to explore and analyse the knowledge, understanding, fears, and expectations of the local people of Gwadar.

4. METHODOLOGY

The study was conducted using a qualitative inductive approach. Qualitative research was chosen with "the desire to step beyond the known and enter into the world of participants, to see the world from their perspective" (Corbin & Strauss, 2008). Grounded theory (Glaser & Strauss, 1967) was used as a research design that provides a systematic framework to investigate social phenomena and explore social reality through interaction with individual research participants (El Haddad, 2016).

This study was conducted in Gwadar city which is the epicentre of CPEC (Abbas, 2019; Kanwal, et al. 2018; Saad, et al. 2019). The geo-economic location of Gwadar has become one of the prime motives behind the mega-developmental projects of CPEC. Keeping in view the qualitative nature of the study, 'saturation' was set as the target during data collection and ultimately 65 interviews were conducted out of which 49 were conducted with males, and 16 interviews were conducted with female participants. All the participants were 'natives' of Gwadar city, by which we mean the local inhabitants of Gwadar whose forefathers have been living in the city. Data was collected through in-depth interviews from different groups of the local population, including fishermen and women, displaced people, micro-businesspeople, political leaders and community influential, daily wage labourers, government officials, and students. Grounded theory was used as the method of data analysis in which the iterative process of data collection, transcription, and analysis of the data was followed.

5. FINDINGS OF THE STUDY

This section of the paper has been divided into different thematic headings, roughly corresponding to the various objectives of the study. This includes the knowledge and attitude of the local people regarding CPEC in Gwadar, their

expectations, concerns, and apprehensions, and the various ways in which the different groups of the local people have been impacted by CPEC projects, both positively and negatively.

5.1. "The Chinese are Coming": Vague Knowledge and Mixed Attitude of Local People

As Gwadar is considered to be the epicentre of CPEC, a lot of work is going on in the city in which various projects are being executed. Three projects have been completed so far which include the Development of the Port and Free Zone, Gwadar Smart Port City Master Plan, and Pak-China Technical and Vocational Institute at Gwadar, whereas some projects are under construction such as Gwadar East-Bay Expressway, New Gwadar International Airport, and Pak-China Friendship Hospital, among others. In addition, several projects are in the pipeline most of which will be completed soon (CPEC Authority, 2022).

Unexpectedly, most people who were interviewed for this study turned out to have very vague and obscure ideas about the various CPEC projects. While all people knew that "the Chinese are coming to Gwadar" and they are constructing roads and other physical infrastructures, very few people were able to name and explain the various ongoing mega projects. However, it was found that the male members of the community and local influential/community leaders had better knowledge of CPEC as compared to women and other groups such as fishermen, daily wage labourers, relocated people, micro-business communities, etc. A female participant who was interviewed for this study stated, "I just know that CPEC is an economic corridor between Pakistan and China. I don't know more than that." A fisherman stated that "I have heard from people that the Chinese are coming to Gwadar and that CPEC will bring development and business to Gwadar." It is surprising that the fishermen usually visit the sea and wander in Gwadar on daily basis but do not know sufficient details about the components of CPEC executed in Gwadar city.

It was found that people had mixed attitudes towards CPEC. It seemed that two important factors determined the attitude of people, namely knowledge about the projects and their utility for the locals. As said earlier, obscure and vague knowledge of the locals caused negative attitudes towards CPEC because unaware people can easily be influenced by negative propaganda. Similarly, the utility of a particular project for the local people also plays a role in whether people have an overall positive or negative attitude towards CPEC. A woman political worker appreciated the facilities brought about by CPEC to the residents of Gwadar by saying that "Before, all of us used wood for cooking in our homes but today, due to CPEC, some houses have gas in their kitchen. This is a big relief for the women of Gwadar." However, most people believed that the native people are in a disadvantageous position and the feelings of exclusion are increasing day by day. The negative feelings were visible more among those people who had lost something, such as their land or source of livelihood, or those who had not received any direct benefit from CPEC. For example, a fisherman angrily remarked:

> *"*Whether CPEC will bring prosperity or not to the lives of people, it has certainly damaged my livelihood; I can't do fishing in the water in which my father and grandfather use to do fishing."

In short, local people have limited and vague knowledge about the various development projects in Gwadar and they have mixed attitudes regarding CPEC, mainly determined by the lack of clear and comprehensive knowledge and the lack of perceived utility of the projects for the local people.

5.2. Shattered Dreams: Expectations and Disappointments of Local People

The government and media created high expectations among local people when CPEC was initially started. The residents of Gwadar expected that CPEC would bring a drastic change in their lives. The level of their expectations was higher in early 2013 and 2014 which started declining over time. As of now, they have fewer expectations because what they have expected has not been delivered to them. A female participant, a wife of a fisherman, explained her expectations and excitement when she first heard of CPEC:

> "One day, almost ten years ago, my husband told me that the Chinese are coming to Gwadar to develop the port and to build other projects. He said that we will get all the necessities of life—gas, electricity, and water and will get employment opportunities and live happy life. I got very happy at that time. … but most of these things didn't come true".

Gwadar is always compared with Dubai and Singapore by CPEC authorities, and this idea is promoted by the media in the minds of the common masses. A female student recalled how her elders used to describe CPEC in very positive ways and compared Gwadar to Dubai.

> "When I first heard about CPEC from my family almost 08-10 years ago, they said Gwadar would develop like Dubai.
> **(وہدے کہ اولی رند ءَ سی پیک ءِ باروا اِش کت گڑا من سرپد بوتاں کہ گوادر دبئی بیت.)**
> We would get job opportunities and everyone would live a happy life".

The population of Gwadar has always faced the issue of clean drinking water and they hoped that CPEC would at least provide them with clean drinking water. A male political leader, who is always in political struggle for locals, said,

> "In the initial days of CPEC, everyone was saying and expecting drinking water, electricity, and other such facilities and people were happy. Some people are still hopeful, but most of us have lost faith in the promises of the government."

These high expectations of the local people are now changing into frustrations and disappointment. The most common dreams for which people are still looking include employment opportunities, clean drinking water, electricity, gas, health facilities, education facilities, etc. On the other hand, some participants, especially government officials and those directly involved in CPEC projects in various capacities, were not only satisfied but expressed a sense of pride that Gwadar has developed considerably due to CPEC. More specifically, such participants emphasised the development of infrastructure and tourism in Gwadar. An official explained that:

> "Gwadar became a tourist point due to CPEC. … Business communities from different parts of the country came and invested here. For example, Taloo Group and Patel Group have come and invested a lot in the city."

At the same time, a couple of officials were critical of CPEC. For example, one official working with CPEC pointed out that:

> "Our expectations from CPEC were much higher but instead, the locals have been in trouble due to increased restrictions on their movement in Gwadar. I have heard from elders that the interpretation of a dream is often negative. The same looks like the case with CPEC."

The metaphor of dream was invoked by several participants who believed that the rosy picture painted by media in the initial days was interpreted literally by the locals who believed that CPEC will change their fate. However, as time passed by, their expectation slowly turned into concerns which have been discussed at length later in his paper.

5.3. "Roads, Roads… Being Constructed Everywhere": Development Projects and Opportunities for Local People

Despite the pessimism expressed by many locals, CPEC is right on its way to 'changing the game' in the region. Gwadar is rapidly becoming an international city and a hub of economic activities. For many people, the first sign of development in Gwadar is the networks of roads being constructed in the city. When asked about how CPEC has changed Gwadar, a student remarked that "I don't see much except the decoration of Gwadar with roads." Responding to the same question, a daily wager remarked:

> "Roads, roads, small roads, bigger roads being constructed everywhere… and other such things."

The mushroom growth of roads in Gwadar was personally observed by the researchers. While most of the roads seem to have no immediate utility, roads are said to be the gateways through which the economy pulses (Claudia, et al. 2015). For example, the Makran Coastal Highway has proved immensely beneficial in connecting the people of the region to the rest of the country. Roads are important to any development agenda which can link the producers to the markets, workers to jobs, students to school, and the sick people to hospitals (Claudia, et al. 2015).

Apart from roads, other infrastructure projects are going on everywhere in the city. A small business owner explained that "There are some good things such public hospitals, parks, stadiums, and industries etc. from which a lot of people will benefit." Even the fishermen who were dislocated from their native homes acknowledged that development was taking place. A fisherman explained that:

> "Though our movement has been restricted in the city as we can no longer catch fish in the sea as we use to and cannot wander freely in the city, some of our community members have benefited from various projects. A few people I know have earned a lot."

It was pointed out that businessmen and owners of land, rental houses, owners of hotels and big restaurants were getting benefits and earnings due to the movement of people to Gwadar from the other parts of the province of Balochistan and Pakistan. People with some initiative and entrepreneurial spirit have become successful in making money.

CPEC has also promoted tourism in Gwadar. A woman political leader explained:

> "The good thing I have noted is tourism. People from different areas visit Gwadar and it has benefited some of the owners of hotels and shopkeepers."

Since the initiation of the CPEC in 2016, Gwadar has become the most visited city in the province of Balochistan (Amir, 2022). A beautiful cricket stadium has been constructed in a corner of the city which will go a long way in promoting sports in Gwadar. The international airport is under construction in Gwadar which would be one of the biggest airports in Pakistan. The roads and airport would enhance the connectivity of Gwadar with the rest of the world. Some participants also pointed out to increased education opportunities, vocational training centres, and health facilities in Gwadar city.

The most significant impact of CPEC in Gwadar, as well as the rest of the country, will be giving a boost to commerce and business. The improved infrastructure of the city will attract investors from across the region which will turn Gwadar into a vibrant economic hub. The local business community has already observed this change. In the words of a participant,

> "Local business is better these days and banking system is also improved due to foreign investment due to better infrastructure such as roads. Land prices increased".

The population has increased in the city which has caused an upward increase in demand for local goods and services. This is how macro-level projects have micro-level impacts. In short, Gwadar has rapidly been changing into a developed city with improved infrastructure, more jobs and business opportunities, tourism, educational and health services, and increased business activities. All these developments are having a positive impact on the lives of the local people, directly or indirectly. However, the development in Gwadar lacks inclusiveness, i.e., the local people are not involved in the process. Ideally, the development of a city should be designed to protect the rights of people who are living in informal and vulnerable settlements, improve the infrastructure with urban design and facilities, and provide tenure security. In Gwadar, there are a few signs that local people are part of the process.

5.4. Relocation and Compensation: A Success Story in Gwadar

CPEC has caused the relocation of local people living near the Gwadar port. Contrary to the expectations of the research team, it was found that most of those people who were relocated from their native villages were feeling happy and satisfied for the reason that the government compensated them in cash and provided them with alternative land/plots for the construction of houses. Although some of these people lost their jobs; overall, they were happy because relocation resulted in improved living standards for these people. In some cases, the local people willingly accepted the proposal of relocation during the construction of the Gwadar port (before the inception of CPEC projects). They wanted to get the basic amenities of life promised by the government. A micro-businessman expressed his satisfaction over their displacement:

> "People previously living in *Kacha* houses have been able to build *Pakka* houses for themselves with the compensation money provided by the government…. the

> compensation is provided according to the need and house size. We had four rooms for which we were given 16 lakh rupees and two flats in the Singhar housing scheme."

A male relocated fisherman explained his views regarding the process of displacement and their apprehension at that time:

> "When we were told to be displaced, we were very shocked. When they said that we were going to be shifted to New Mullah Band, we resisted and protested because we thought that it would affect our life and livelihood as the sea would be very far from us. But today I am happy that I agreed and shifted here. When we were in our old Mullah, we had congested houses but here we have got an open and wide house."

Most of the relocated and resettled people also seemed satisfied with the process of relocation. The authority consulted the local people and sought their consent before relocation. It also needs to be noted that relocation had both positive and negative impacts on people. The most visible impact of relocation in Gwadar was the change in the means of livelihood of people who used to live along the coast and who were dependent on fishing and salt making. A relocated person pointed out that their sources of livelihood were affected as they used to work in salt fields which were now far away from their new location. Another male pointed out that:

> "Everything here is far from like the city-schools, hospitals, etc. —and the sea is far away, and our works of fishing are affected. … Our children's education is affected because the schools are far away, and transportation is costly".

In short, relocation and monetary compensation of local people have resulted in contradictory effects. On the one hand, people have received what they think is fair compensation which is a positive. On the other hand, they have lost their previous livelihoods and their access to their previous places of work has become difficult. In some cases, some of the relocated people have sold again their new houses to migrate back to the old city in search of better livelihood opportunities and civic facilities.

5.5. "A Sword is Hanging Above Our Heads". Fear of Displacement among the Local People

Like any other mega project, CPEC-related development in Gwadar has already resulted in the displacement and relocation of thousands of local people. More people are at risk of displacement and have been living under constant fear of losing their land, homes, and ways of livelihood. When asked what their biggest concern was, a 39-year-old community leader put his fear in the context in a vivid manner:

"The locals of Gwadar are suffering from the fear of displacement from the beginning. …For us, this is a hanging sword above our heads and anytime the government can order us to leave the area. We have to live in constant fear of losing our house and land."

In particular, people from the east neighbourhood fear that they will be displaced, sooner or later. The majority of the fishing communities reside in the East Bay neighbourhood and are afraid that their jetty is being shifted from the East Bay of the sea

to nearby the town of Surbandar. The poor segments of society have a more intense fear of displacement from this city in the near future because the social, economic, and geographical conditions are becoming unfavourable for native inhabitants. An old man argued that:

> "Gwadar is becoming a city for the rich, and as such, the poor will ultimately be pushed out of the city to make way for the rich people."

It was found that the people from the old Mullah Band to Javed Complex situated East neighbourhood were at high risk of displacement due to current and future development projects in Gwadar. Projects such as Gwadar port, East Bay Expressway, Free and Industrial Zones, Planned Railway Tracks and all other related projects under the umbrella of CPEC will result in significant displacement of local people. In the words of a male participant:

> "The local people are gradually being taken out. Gwadar won't be the same anymore; rather, it will be a new city for businessmen and investors".

On the other hand, a businessman opined that displacement is indispensable and inevitable by saying:

> "You cannot have a new Gwadar with old people. New people have to come here, new buildings have to be erected in places of old houses, and the old culture has to be replaced by a new one. Only then can we have a newly developed city with an international character".

It can be inferred that not all people viewed displacement as a terrible thing if, in return, they expect to receive good compensation and better livelihoods. Political activists and socially aware individuals with nationalist outlooks were eager to highlight this threat more than business-oriented and enterprising individuals among the research participants.

5.6. Strangers in their City: Illumination of Gwadar and Alienation of Gwadaris

As the hustle and bustle in Gwadar city is increasing day by day due to ongoing CPEC projects, tourism, and business and commerce, the local people are feeling a sense of alienation in their native town. When asked for the reason, a government official said:

> "It is because most of the local people are not a part of CPEC projects. Not enough people are getting jobs in CPEC projects, and they continue to engage in their old occupations. … They are not feeling a sense of relationship with the new developments going on in Gwadar."

These remarks point out towards the lack of sufficient sense of attachment between the local people and CPEC projects. Secondly, it was found that the local people of Gwadar were fearful of the rapid demographic change in the city. They think that their language and culture are going to vanish by the non-locals. The population of non-Balochi speakers has been increasing since CPEC. One of the officials elaborated that

> "Some of the locals think their language and culture are vanishing. For example, a large number of people are migrating to Gwadar which outnumber the Gwadari people".

The fact is that majority of migrants to Gwadar are from other parts of Balochistan, especially from the surrounding districts of Kech and Panjgur. A very less percentage of these migrants are from China and other provinces of Pakistan. This exaggerated fear seems to be due to the following two reasons. Firstly, it is the effect of political discourse/rhetoric currently at its peak in Gwadar, especially the Gwadar rights movement led by Moulana Hidayat Ur Rehman (see *Dawn*, Dec. 01, 2021). Secondly, local people are afraid of losing control over their lives and neighbourhoods. Due to their lack of skills and resources, the local people cannot catch up with the pace of the ongoing development. They feel being outperformed by 'outsiders' due to which they exaggerate the issue. It has been observed that due to the increased number of non-local people, hate between the locals and non-locals has increased. For example, locals hate the people of Turbat and Panjgur as they think that they are taking the job opportunities and benefits of CPEC. A male political leader responded:

> "The local people are fearful that a demographic change may happen in Gwadar. They think that they will soon be replaced by non-locals because they (the local people) are mostly uneducated, and they lack skills."

A female student put it more vividly by saying that:

> **آہاں تُرسیت کہ چو مہ بیت وتی جند ءِ ہَند ءَ درآمدے بہ بنت"**
>
> "They fear that in future they will be strangers in their own city."

Moreover, some of the participants also pointed out that the local culture was getting eroded and there was no mechanism/policy for the preservation of the local culture, language, and historical places that used to be the identity of Gwadar city. As an example, a participants reported that:

> "There used to be a big fort (*morcha*) of the Portuguese army at the top of Koh-e-Batil, but it has been demolished and you can't find it there now. Instead of protecting such sites, they are destroying them".

While historical sites are being destroyed and eliminated, modern monuments are buildings are constructed and illuminated to increase their visibility. Such developments are alienating the local Gwadaris. A more inclusive development plan is required in which a participatory model should be adopted by planners and policymakers to preserve the cultural identity of the city and include the local people in the process.

5.7. Chinese Trawling and the Issues of Local Fishing Communities

About 70 percent of the population's livelihood depends on marine resources and fishing for the past several generations. The fishing communities consider themselves to be the first causality of CPEC projects as their lives and livelihoods have been affected in several ways. They also consider themselves to be the true locals of Gwadar because most of them have been living in the old town of Gwadar for centuries. In particular, the issue of Chinese trawling in the sea has created much unrest among the fishing communities and other groups of local people. The local people alleged that the Chinese are taking all things from them one by one. They pointed out that due to trawling by Chinese companies, there will be less or no fish in the sea and it will make the fishermen unemployed. During the fieldwork in Gwadar in July 2021, the researchers observed and

participated in a *Jirga* (council of elders) which was organised by all political and fishing community parties to raise the issue of illegal fishing by Chinese and Sindhi trawlers and the use of the conical net by the trawlers which have caused much damage to marine life in the sea. One of the speakers of the *Jirga* said,

> "We are the sons of the soil and know how to protect our sea. We request the provisional and federal governments to take seriously our legal and constitutional demands and stop Chinese trawling immediately. If not, then we will resist."

Another local fisherman argued that:

> "Trawling is a sort of genocide of fish and other marine species... fish lay eggs in the summer season and we the locals do not fish in that season. The Chinese don't take such care".

According to one fisherman, the Chinese have brought around 100 trawlers which have seriously disturbed the livelihood of the locals and if the trawling culture remains the same, there will be unemployment and poverty in the local fishing communities. Ban on illegal Chinese trawling was also one of the demands of the protest by the local population in Gwadar in November 2021 led by Maulana Hidayat-ur-Rehman. In response to these protests, the Government of Balochistan issued a notification in November 2021 in which a ban was imposed on illegal fishing/trawling within twelve nautical miles of the Gwadar Sea area.

In short, the fishing communities of Gwadar have been affected the most by CPEC. Their sources of income are shrinking, and the Chinese trawling has almost threatened their livelihood. Hence, affirmative action is needed to protect them and their source of livelihood.

5.8. Beyond the Glittering Port: The Threat of Ghettoisation of Local Population

It was observed during the fieldwork that local people in Gwadar have been confined to "Old Gwadar" where the standard of living is very low as compared to the new Gwadar which is glittering with lights and where development is going on day and night. Old Gwadar faces a severe shortage of clean drinking water, electricity, and other such faculties. The streets are narrow and unpaved with *Kacha* houses. Poverty is visible everywhere in old Gwadar. There are rumors that this is intentional as the government wants these people to voluntarily migrate elsewhere. A male political leader said, "They want us to move out, to leave the place. But where should we go, and why? It is our land, and we should be provided facilities here." A female student elaborated and contrasted the two worlds: the old and the new Gwadar in the following words:

> "I have seen the local area of Gwadar such as Shado Band and Ismaili Mohalla. There the people do not have the basic facilities … CPEC has decorated the surface of Gwadar but if you visit inside of (old) Gwadar you will see the nasty Gwadar where no signs of CPEC are visible".

The common perception of people is that the government is not facilitating the local people because the government is interested in the land (Gwadar) not the people (Gwadaris). A male participant explained:

> "The old city is under threat as it is near the port. The people of the old city are not getting facilities like roads, clean water, and electricity. It is like people are being forced to leave the city".

It has commonly been observed by the local people that roads are being constructed in those areas where there are no people; and where there are people, there are no roads. There is dirt everywhere in the old city where poor people live. The glittering Gwadar port and the rest of the city are clean and beautiful; the opposite can be seen in the old city. This process of ghettoisation, in which the local, poor population are increasingly marginalised has increased the feeling of estrangement, discrimination, alienation, and altogether elimination of the local people.

6. DISCUSSION

Mega development projects always have diverse effects on the lives of people. It is usually believed that macroeconomic development will have a trickle-down effect which will eventually improve the lives of poor people. However, this idea has proven to be a mere excuse for public policymakers for ill-planned development projects in which some people at the micro level face the burden (Morse and Berger, 1992; Flood, 1997). Therefore, it is the primary responsibility of policymakers and authorities to ensure that economic inequality is reduced and damage caused (if any) is properly compensated. This study was conducted with the assumption that CPEC projects in Gwadar would have both positively and negatively affected the local people of Gwadar, and that the perspective of the native people living there must be explored and scrutinised.

It was surprising to find out that the local people have a very vague knowledge of CPEC and its associated projects. Except for a few well-known projects, people hardly know the names and natures of various ongoing initiatives. The common misperception is that the Chinese are coming to take over Gwadar and that the local people will be soon displaced to other areas. Indeed, displacement has taken place as several fishing communities have been relocated by the government. However, the way this process of relocation has been executed by the government is a textbook example of a success story in Gwadar as the relocated people were found to be satisfied with the prior consultation and compensation. Most of the local people seem to exaggerate their issues. They assert that "we have received no benefit from CPEC." In reality, however, most people benefited indirectly or directly in various ways. For example, business opportunities for local entrepreneurs have increased manifold. Public hospitals, parks, stadiums, industries, and other such infrastructures are catering to the needs of the common people. The influx of migrant workers from other parts of the country has increased the demand for housing and hoteling which has benefited the locals. Land prices have increased due to which the local landowners have earned a handsome amount of money. Local products such as Gwadari halwa (sweets) have found new markets and their demand has increased. Gwadar is fast becoming a tourist spot and the entertainment and recreation facilities are now accessible to the local people as well. Despite these tangible benefits, the local people want more. It is mainly because they have developed much higher expectations from CPEC due to media hype around the project, and because people do not know how to assess the indirect benefit that they might have received or will receive from development projects. Negative propaganda against CPEC has also visibly impacted the perception and attitude of the local people. Some people tend to exaggerate the issue of 'outsiders taking up everything' even though most of the workers in Gwadar are ethnic Balochs from the neighbouring districts of Gwadar. The presence of security checkpoints has resulted in restrictions on the movement of local people which is one of the reasons responsible for the disillusionment of the local people.

Some of the issues of the local people are real and government needs to revisit its policies and practices in Gwadar. People must be made to feel part of CPEC projects by providing them with more employment opportunities. There is a need for the policymakers to involve the local people in the planning process and to make sure of inclusive and people-centred development in Gwadar. The Gwadar Development Authority and other such bodies are feeling no obligation and accountability to the people. This should change. Instead of working as a bureaucracy, a more democratic and participatory approach should be followed. This will help in countering the negative propaganda and anti-CPEC discourse.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. Conclusions

There seems to be a communication gap between the local people and CPEC authorities/government due to which most of the local people have vague knowledge and blurred understandings of CPEC projects. The various groups of local people such as fisher folks, micro-businessmen, local politicians, students, and government officials had different perspectives and were variously impacted by CPEC. A lot of visible developments could be witnessed in the shape of improved roads connecting Gwadar to the rest of the country, hospitals, schools, parks, stadiums, etc., which have greatly benefited the inhabitants of the city, both locals and non-locals. These developments have directly or indirectly benefited the local population in the shape of employment, improved business opportunities, tourism, improved health and education facilities, and the like. However, the locals have also developed feelings of discrimination and alienation as they believe that the government has failed to provide basic facilities, especially drinking water, electricity, and gas. Frustration among the local people, coupled with their blurred knowledge of CPEC, is being manipulated by local politicians and other groups who present a negative picture of CPEC. The fishing communities are the most directly affected; some of them have lost their livelihood due to relocation, others have no access to the sea due to the construction of CPEC projects along the coast. Overall, people tend to exaggerate their problems but most of their genuine issues need to be solved so that the feeling of deprivation is reduced among the local people. Adaptation of a more inclusive and people-centred development policy is imperative to gain the trust of the local people and to bridge the gap between authorities and the local people in Gwadar.

7.2. Policy Implications

The study recommends the following measures that will hopefully help in mainstreaming the local people into the development process.

(1) *Employment opportunities* for the locals should be prioritising which will glue them with CPEC and will create a sense of belonging which is currently lacking.
(2) *Fishing and marine life policies* should be devised to protect and regularise the fishery industry. The Chinese and other trawlers must be stopped or better managed.

(3) *A special developmental package for the fishing communities* should be announced as they are the most vulnerable and the 'first causality' of CPEC projects.
(4) *The provision of drinking water and electricity supply* to the residents of Gwadar will greatly help in reducing the ill-feeling among the locals.
(5) *The provision of skill training and promotion of SMEs* by the government will increase the employability of the locals which will create a feeling of inclusion among them.
(6) *Engaging and educating the locals* on the nature and purpose of CPEC projects should be an inbuilt part of the CPEC planning/Gwadar Master Plan to reduce the communication gap between the local people and the CPEC authorities/ government.
(7) *The concept of corporate social responsibility (CSR)* should be invoked more vigorously and a proper policy should be developed to channel the CSR fund more systematically.

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Political Dynasties and Local Economic Development in Pakistan

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Political dynasties are entrenched in Pakistan's political system. Dynastic legislatures constitute more than 50 percent of elected politicians in Pakistan. However, until recently, no scientific study was conducted to evaluate the economic performance of dynastic parliamentarians. This study explores the effect of political dynasties on local economic development at the constituency level across Pakistan. More specifically, the objective is to examine whether constituencies with dynastic persistence are significantly different from the rest in terms of economic activities and public good provisioning. To measure political dynasties, data on elected politicians who won 2002, 2008, & 2013 general elections are utilised to extract information about a politician's family background. This information is then matched with the constituency level indicators of economic development and public goods. The findings show that dynastic legislature underperforms relative to non-dynast in terms of local economic development and public good provision. Constituencies with non-dynast winners have improved water and sanitation facilities, better infrastructure, and significantly higher access to public services such as electricity, gas, and telephone. The study recommends that limiting the role of parliamentarians in discretionary funds and development spending, and empowering the local government system would minimise the performance differences across constituencies.

PREFACE

There has been a general debate about which institution performs better in terms of service delivery and economic development. The discussion generally starts from the comparison of political parties and settles down on individual performances. Usually, the parties are discussed in terms of their experiences in managing government affairs. However, since politicians move between parties, it makes perfect sense to compare their performances. Families of some of these elected members have been in power for generations. This resulted in the formation of political dynasties. The question is whether these politicians with more experience perform better than those who are relatively new. In other words, whether or not dynast politicians outperform non-dynasts? This sets up the premise for this study where we scientifically examine and compare the economic performances of dynastic members with the non-dynast ones. The scope of this study covers all the members of the national assembly (MNAs) who contested in the three elections (2002, 2008, 2013).

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1. INTRODUCTION

Political dynasty is a prevalent phenomenon in many democratic societies where political capital (skills, connections, brand-name, loyal voters, etc.) transfers from parents to children over time (Dal Bó, et al. 2009; Rossi, 2009; Querubin, 2011; Mendoza, 2012; Cheema, *et al.*, 2013; Bohlken & Chandra, 2014). The transfer of political capital increases a dynast heir electoral advantage over a non-dynast and thereby decreasing his incentives to deliver public goods. Nevertheless, the initial political endowment may enable a dynast to outperform the non-dynast in service delivery. The overall impact of dynastic persistence on economic performance is, therefore, unclear.

Pakistan is among those countries where the share of elected political dynasties in parliament is one of the highest in the world. Ahmad and Rehman (2020) observed that more than 50 percent of winners in the national assembly of Pakistan (2002, 2008, 2013 elections) have dynastic routes. Before 2008, there was very little debate among politicians on the economic performance of dynast vs. non-dynast legislatures. However, since 2008, the debate is intensified among the leaders of main political parties. [1] Interestingly, until recently, there was no scientific evidence on which this debate is based.[2] This motivates us to carry out a comprehensive study on the effects of dynastic legislatures on local economic development across Pakistan.

In an ideal democratic system, a government should spend its resources to bridge the gap between underdeveloped regions with the developed ones. However, political elites exercise considerable de facto control to divert resources to their constituencies without taking into consideration the principle of equity. The optimal allocation of resources for public service provision could be done through effective local government institutions. However, designing an efficient local government is a disincentive for the legislatures who have significant control over the allocation of resources at national and sub-national levels.

An example of this is the access of parliamentarians to discretionary development funds in Pakistan. President Zia-ul-Haq introduced a special federal program in 1985 that allocated funds to elected legislatures of the national assembly for the development of

[1] https://www.theweek.in/wire-updates/business/2019/07/22/fgn19-pak-imran-dynasty.html & https://www.thenews.com.pk/latest/775177-imran-khan-is-an-inexperienced-player-maryam-nawaz

[2] Ali (2016) and Malik, et al. (2021) find that dynastic legislatures have negative effect on different indicators of economic performance. However, the scope of there studies are limited to the province of Punjab.

their constituencies. Following the footsteps of Zia, successive governments continued the program under different names. Afzal (2009) and Malik (2021) provide a detailed analysis of the program under different governments. For example, between 2008 and 2013, the program was named the People's Work Program by the then-Pakistan People Party (PPP) government. Under this program, every parliamentarian was provided access to Rs. 20 million for developmental projects in the respective constituency. The funds could be used for health, education, electrification, roads, and other types of local infrastructure.[3]

But what are the incentives for politicians to invest in local development? The major incentive is to be reelected. Nevertheless, this depends on several factors including the concentration of political power, political capital, and connections, loyal voters like baradari, etc. In turn, these factors depend on several individual and constituency level factors. Among them, being a member of a political family (dynasty) stands out. Existing evidence and economic theory conclude the ambiguous effects of dynastic politicians on economic development. On the one hand, the incentive to establish a dynasty on the part of the founder may encourage long-term investments to build political capital, thereby leading to economic development. However, the descendants—who inherit political capital—have lesser incentives to ensure economic development (George and Ponattu, 2019). Therefore, the net effect of political dynasties on economic development is ambiguous.

Given the above discussion and the fact that Members of the National Assembly (MNAs) in Pakistan enjoy considerable influence in the allocation of development funds (discretionary and otherwise), the objective of this study is to explore the causal effects of political dynasties on local economic development in Pakistan. More specifically, our objective is to study whether constituencies with dynastic persistence are significantly different from the rest in terms of economic activities and public good provisioning.

To measure political dynasties, data on elected politicians who won 2002, 2008, & 2013 general elections are utilised to extract information about a politician's family background. Similarly, different proxies including the growth in night light luminosity, level of wealth and consumption, access to electricity, gas, telephone, water, and roads at constituency, village, and individual levels are used to measure economic performance at the constituency level.

Utilising close elections regression discontinuity design, we show that constituencies with a dynast winner have 1 percentage point lower economic development than a non-dynast winner. Similarly, the access to public goods (electricity, gas, water, sewerage, and roads) is 25 percent lower in dynast constituencies than the non-dynast ones. Furthermore, the households in dynast constituencies have 20 percent lower consumption.

The rest of the study proceeds as follows: The theoretical linkage between a dynastic politician and economic development is explained in Section 2. Section 3 describes the data and variables used in the analysis. Some stylised facts between

[3]The influence of legislatures in the local development can be assessed from the fact that the incumbent government of the Pakistan Tehreek-i-Insaf (PTI) initially put a stop to the allocation of funds to elected politicians (https://www.dawn.com/news/1428660). However, recently, Prime Minister Imran Khan announced Rs.500 million for each MNA so that they can initiate development schemes in their constituencies (https://www.dawn.com/news/1604040).

dynasties and economic performance are provided in section 4. The identification strategy is discussed in section 5. Section 6 presents results and discussion while section 7 concludes the study with some policy implications.

2. CONCEPTIONAL FRAMEWORK

The theoretical underpinnings of the impact of political dynasties on local economic development can be discussed using two frameworks. This first one is that of George and Ponattu (2019) who extended the political agency framework of Besley (2007) by nesting a probabilistic voting model with electoral uncertainty in an overlapping generations (OLG) framework. The model assumes that politicians possess "human capital" and "political capital" and that both are heritable. Human capital refers to the skills that enable a politician to govern well. Political capital signifies assets (such as name recognition and/or strong network) that can help a politician get elected, but do not improve his performance in the office. Hence, these are alternatively named as "governing capital" and "campaigning capital" respectively. George and Ponattu (2019) separate two effects, namely the "founder effect" and the "descendant effect". Incumbent politicians, who want to be reelected, would take costly actions and put in more effort to provide public goods and improve local economic development. The efforts will further increase if they have bequest motives; that is, the intention to secure the political office for their future generations. Heritable human capital thus gives incumbent parents further incentive to perform well to signal to voters that they and, therefore, their descendants — are high types. This is called the founder effect which is expected to have a positive impact on local economic development. However, a founder could only be identified if a dynasty is formed in the future. Hence, today's non-dynast could be a potential "founder" of a future dynasty.

Descendant dynasts, on the other hand, may have both positive and negative effects on economic development. They inherit human or governing capital in the form of skills and political knowledge which they can put to use to improve the provisioning of public goods in their constituencies. The downside, however, is that these descendants usually do not start at the grassroots and are, therefore, disconnect from ground realities. Moreover, they also inherit political capital (e.g. a prominent name or a powerful network) which they can use to persist in power even when they underperform. Since the probability of winning of descendant dynasts is expected to be high due to inherited political or campaigning capital, they are ready to give up some of this probability for additional leisure (or reduced effort). Consequently, descendant dynasts may underperform compared to non-dynasts. The descendant effect dominates the founder effect thereby resulting in an overall negative effect of dynasties. This suggests that when the subsequent generations of politicians enter into politics, their performance deteriorates to the point that residents of their constituencies become poorer and are left with fewer public goods (George and Ponattu, 2019; Malik, et al. 2021).

The second framework finds its roots in the political theory of economic backwardness advocated by Acemoglu and Robinson (2006b). It suggests the political elites confront a trade-off between potential economic gains and political power. *Ceteris Paribus*, they do want reforms-led prosperity that might translate into increased future rents for them. Nonetheless, the *ceteris paribus* assumption does not hold in reality.

Hence, these reforms could induce changes that can potentially weaken their political advantages over other groups. For instance, educational reforms and technological progress create political awareness resulting in political competition and thereby reducing their hold on their respective constituencies. They could therefore decide to "block beneficial economic and institutional change when they are afraid that these changes will destabilise the existing system and make it more likely that they will lose political power and future rents" (pp. 115-6).

This theory suggests a non-monotonic relationship between political competition and resistance to development. The political elite facing extensive competition, or none (due to their complete dominance) will improve economic development through reforms and the adoption of new technologies. Those in between these two extremes, however, will adopt the opposite attitude. This has a straightforward explanation. In case of extreme competition, if the political elites do not innovate and improve, the dissatisfied voters, with many options available due to competition, would simply replace them. On the other hand, elites with complete dominance and lack of political competition will have no threat of losing political power in case of economic and technological development. This absence of a trade-off between economic gains and power encourages them to invest more effort in local economic development. In contrast to these two cases, politicians who do have some control and power in their constituencies but also fear potential competition in the future would be lured into blocking innovation and reforms to prevent any political competition and being replaced eventually. This would, however, ultimately translate into the underperformance of the dynast politicians. Since this latter case is more prevalent in the contemporary world, one could expect the underperformance of the dynast politicians for reasons other than the moral hazard problem as discussed in George and Ponattu (2019). Overall, these two frameworks provide theoretical bases for the ambiguous relationship between dynastic politics and local economic development. We, therefore, turn to empirics to explore the nature of this relationship.

3. DATA AND VARIABLES

In this section, we discuss important variables and their sources to be used in the empirical analysis. We utilise different sources on political and economic development variables at the national constituency level across Pakistan.

3.1. Political Dynasties

Our main variable of interest is political dynasties. The identification of political dynasties is one of the important and challenging parts of this study. The variation in the political dynasty variable depends on the definition a researcher utilises. In the last decade, a strand of literature on the persistence of political dynasties has evolved which describes various features of political dynasties including the way it is defined (Dal Bo, et al. 2009; Rossi, 2009; Querubin, 2011). Based on this extensive literature, we define a politician as a dynast if at least *one member* from his family[4] has been elected as a

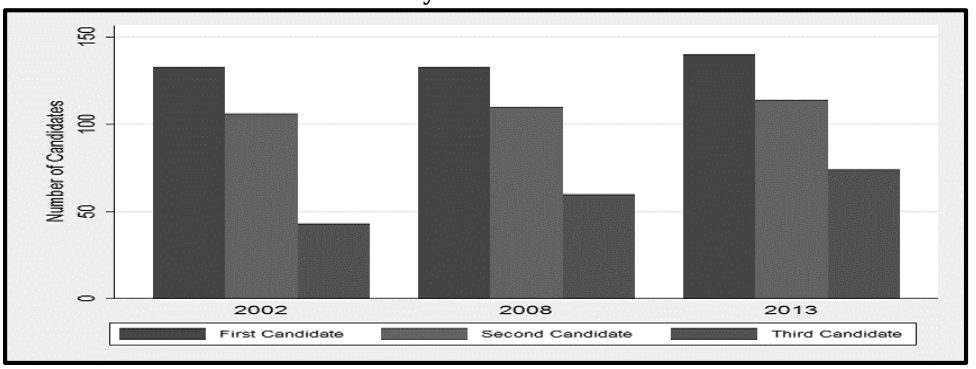
[4] Family means grandfather, grandmother, father, mother, uncle, brother, sister, father-in-law, andmother-in-law.

legislator in the Lower House (i.e., national assembly) of Pakistan.[5] This definition is also used by Ali (2016) and Cheema, et al. (2013) in their studies for Pakistan.

Once defined, the subsequent task is to identify the dynasts' members of parliament. In most countries, there is a systematic pattern in the names of members of a family. *Surname* is often the family name. In such cases, it is easy to identify the dynasties by matching *family names*. Ali (2016) argues that such a technique is not relevant in the case of Pakistan where surnames are not family-specific, but clan-specific.[6] Therefore, instead of matching *surnames*, we exploit different sources to identify the familial links of the candidates. Firstly, significant information has been extracted from Anjum (1990) and Cheema and Naseer (2013). The remaining data is obtained from the archives of the digital newspaper. Some of the data has also been collected from the websites of the national assembly. Furthermore, we also contacted some reporters for the local newspapers to confirm our identified dynasties for each constituency.

We collect information on winner and runner-up candidates (both dynasts and non-dynasts) in the national assembly for the three elections, i.e., 2002, 2008, and 2013.[7] Figure 1 reveals that about 50 percent of winners and 41 percent runner-up electoral candidates in the national assembly in the past three elections (2002, 2008, and 2013) belong to dynastic families. Similarly, on average, 20 percent of the contesting candidates in each constituency in these three elections were members of the dynastic families. These numbers depict the entrenched role of dynastic politics in the electoral process of Pakistan.

Fig. 1. Number of Dynastic Candidates in Top Three Contestants of National Assembly



3.2. Local Economic Development and the Use of Nighttime Luminosity

The local economic development is the dependent variable of the study which can be proxied through various economic variables. Unfortunately, in Pakistan, like many

[5]Members of the Upper House are elected indirectly through provincial assemblies. So, they do not exercise their power and influence directly.

[6]For example, "Bhugti", "Mazari", "Aurakzai" and so forth.

[7]For methodological reasons including change in the constituencies' boundaries and availability of nightlight data, which hinder the estimation of long-run effects, the election of 2018 has not been considered in this study.

other developing countries, information on socio-economic indicators for all the national assembly constituencies is not available. This becomes an impediment to measuring economic growth or development at the constituency level. To overcome this limitation, many scholars sorted out the possibilities of using satellite-based remote sensing, including nighttime illumination imagery at national and subnational level as a proxy for measuring economic activities (Ebener, et al. 2005; Sutton, et al. 2007; Xi & Nordhaus, 2010; Henderson, *et al.* 2012; Donaldson & Storeygard, 2016; Bruederle & Hodler, 2018). However, an important question is how valid is the use of nightlight luminosity as a proxy for economic growth. The answer lies in the literature on electricity consumption, nightlights, and economic growth. Several empirical studies have concluded a high correlation between electricity consumption and different indicators of economic development (income, growth, poverty, agriculture, industrial production, etc.).[8]

The availability of total nighttime light depends on both public and private sector investment in the provision of electricity. However, in a country like Pakistan where government footprints in the provision of electricity are significantly high, the correlation between nighttime illumination and public sector investment in electrification seems to be one of the highest in the world.[9] Similarly, the emerging literature on the use of nighttime lumens shows a high correlation between state investment in electrification/ electricity provision and lights visible from space at night (Elvidge, et al. 1997; Min, 2008). Furthermore, some studies have used the level of electrification as a proxy to measure the extent of politically driven provisioning of public goods (Agnew, et al. 2008, Carlson, et al. 2008, Min, 2008, Min, 2010, Paik and Shapiro, 2013, Tantri and Thota, 2017, George and Ponattu, 2019). The validity of using the luminosity data for economic development, therefore, depends heavily on the politics of local government in providing public goods.[10] Recently, Hasan, et al. (2021) measured district-wise GDP in the province of Khyber Pakhtunkhwa while using harmonised nightlight data.[11] The study finds that nighttime luminosity is useful information to measure non-form economic activity. Given this evidence, we argue that nighttime illumination is a strong predictor of local economic development and can therefore be used as a proxy to measure economic activities and the provision of public goods.

The raster images of stable nighttime illumination were made available by the National Centers for Environmental Information (NOAA).[12] In this study, we only use lights from human settlements in cloud-free composites images produced using all the available archived satellite images of Defense Meteorological Satellite Programs Operational Linescan System (DMSP-OLS) during a calendar year. These composites are scaled onto a geo-referenced 30 arc-second grid (approximately 1 km^2) where each grid cell takes on a 6-bit scale digital number (DN), from 0 to 63. For each year, a grid cell with a value of zero can be interpreted as an area with zero nighttime light. On the other

[8] Few of these studes are (Ferguson, et al. 2000; Ghosh, 2002, Yoo, 2005).

[9] Two publicaly owned companies, Water and Development Authority (WAPDA) and Distribution Companies (DISCOS) except Karachi Electric have control over the generation, transmission, and distrubiton of electricity in Pakistan.

[10] The local government in Pakistan is either missing in the democratic system or depends on constituency level politicians for resource allocation.

[11] https://seed-pk.com/wp-content/uploads/2021/08/NTL-PolicyBrief-Aug-1.pdf

[12] The data is accessed through https://www.ngdc.noaa.gov/eog/night_sat/nightsat.html

hand, the value of 63 is the saturation value and indicates the brightest area for each year. For each region, we calculate the average DN and use this DN mean and its growth as our key dependent variable."

Table 1

Summary Statistics of Nightlight Information for National Constituencies

Variable	Obs	Mean	Std. Dev.	Min	Max
			Overall		
Nightlights (Mean)	816	15.63575	19.46644	0	63
Nightlights (Median)	816	14.34191	20.37084	0	63
		2002			
Nightlights (Mean)	272	15.4361	19.22151	0	63
Nightlights (Median)	272	14.02574	20.223	0	63
		2008			
Nightlights (Mean)	272	15.16347	19.6974	0.003	63
Nightlights (Median)	272	14.03676	20.57814	0	63
		2013			
Nightlights (Mean)	272	16.30769	19.5308	0.003	63
Nightlights (Median)	272	14.96324	20.3707	0	63

The luminosity data is then merged with the national constituencies. Table 1 provides descriptive statistics of the night luminosity from human settlements. It shows the average change in the night lights across constituencies since 2002. Similarly, Figures 2, 3, and 4 present the spatial distribution of raster images of nightlight in Pakistan for the years 2002, 2008, and 2013, respectively. The intensity of light is significantly high in the eastern part compared to the rest of the country. Furthermore, these nightlight figures are also extracted for national constituencies for the respective years.

Fig. 2. Spatial Concentration of Nightlight in 2002

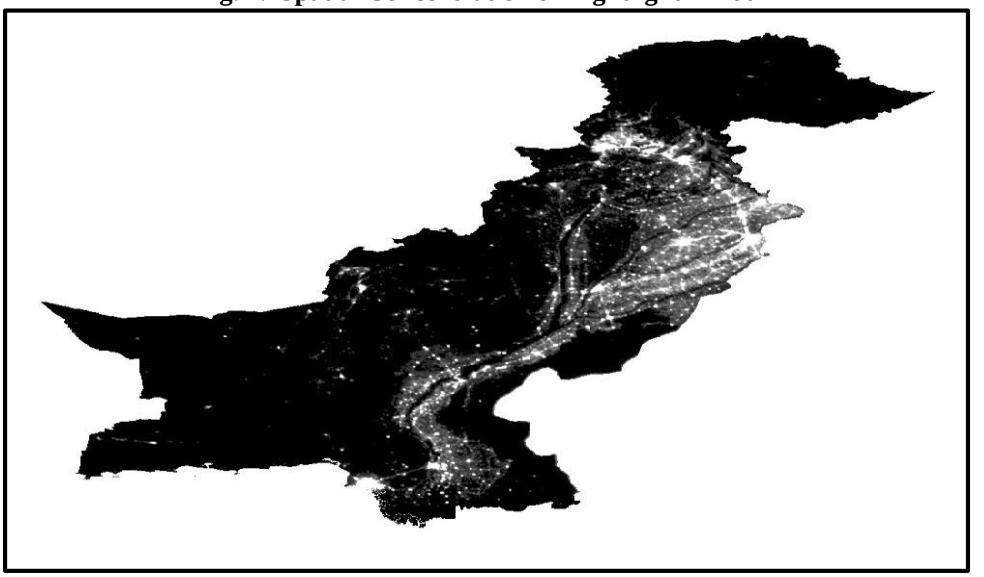


Fig. 3. Spatial Concentration of Nightlight in 2008

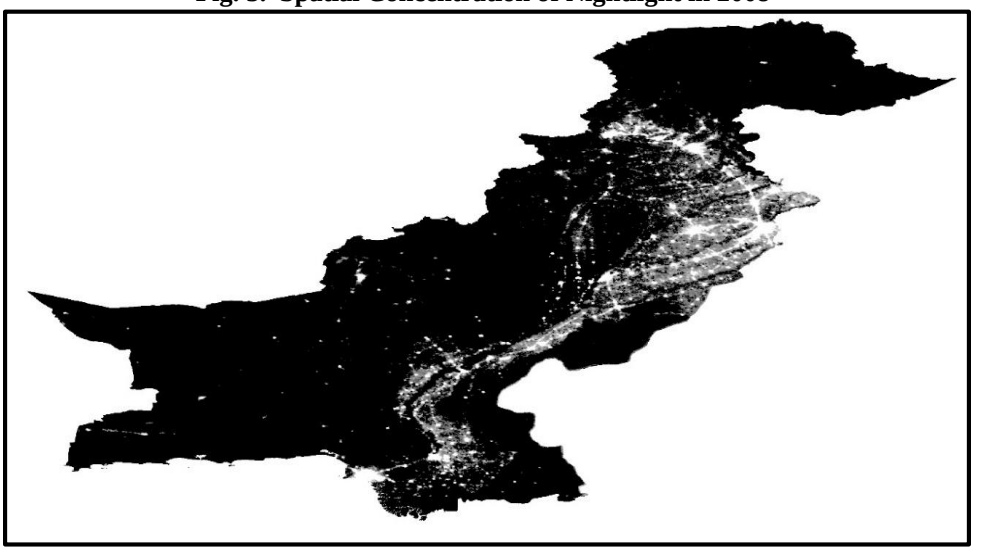
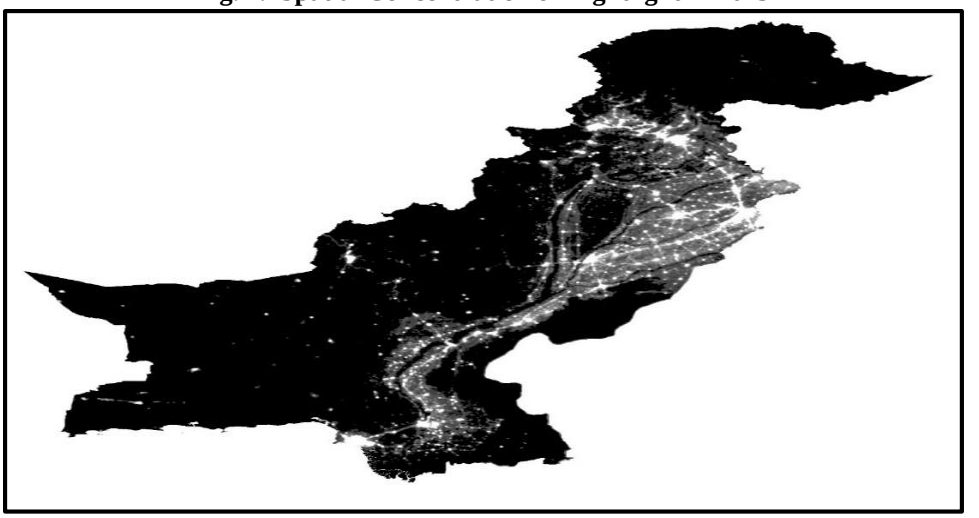


Fig. 4. Spatial Concentration of Nightlight in 2013



3.3. Control Variables

To minimise the likelihood of the omitted variables bias (OVB) in the empirical analysis, we also collected data on socio-economic characteristics at the district level for 2002, 2008, and 2013 periods. These include data on constituency level variables like the number of candidates who contested in the election, voter turnout, voter share of the incumbent candidate, ruling party legislature, winning margin between the winner and runner-up candidates, and the number of independent candidates. Finally, to further minimise OVB which may arise due to time-invariant unobserved heterogeneities, the regressions include district and constituency fixed effects and election (year) fixed effects to check for time-invariant or slow-changing unobservables. Table 2 provides summary

statistics on both dependent and control variables which will be utilised in a regression discontinuity (RD) design framework. Interestingly, some constituencies have experienced negative nightlight growth while others have as much as high as 67 percent in the electoral cycles of 2002-2008 and 2008-2013.

Table 1

Summary Statistics of Dependent and Control Variables

Variables	Mean	S.D.	Min	Max
RD Variables				
Mean of Nighlight Luminisity	15.64	19.47	0	63
Growth in Nightlight	0.337	2.999	-1	67
Dynast Margin of Victory	0.031	0.213	-0.64	0.62
Dynast Winner	0.553	0.486	0	1
Control Variables				
Number of Candidates	10.812	6.653	2	57
Turnout	45.92	12.34	15.23	84.77
Vote Share of the Incumbent	0.146	0.174	0.02	0.924
Ruling Party Legislator	0.688	0.464	0	1
PPP Legislator	0.238	0.426	0	1
PML(N) Legislator	0.265	0.442	0	1
PTI Legislator	0.0332	0.179	0	1

3.4. Pakistan Rural Household Panel Survey (PRHPS)

One way to test the validity of the use of nighttime luminosity as a measure of local economic development is to compare the results from nightlight with other data on socio-economic indicators at the constituency level. The Pakistan Rural Household Panel Survey (PRHPS) does provide such information.[13] The three rounds of the PRHPS have geocoded information on socioeconomic and infrastructure indicators at the village and constituency levels. The information on rural development is generated from Round 1 and 1.5 (PRHPS, 2012) while political controls are constructed from Round 2 (PRHPS, 2013). The various dimensions covered in this data include information on access to electricity, gas, piped sewage, piped water, carpeted and non-carpeted roads, distance to school and hospital, political knowledge, trust in institutions, politicians, law and order situation, to mention a few.

This survey, however, is only representative at the rural level. It is based on approximately 2,090 households from 176 *mouzas (villages).* Four mouzas (villages) are randomly selected from each of 19 rural districts in the provinces of Punjab, Sindh, and Khyber Pakhtunkhwa.[14] Similarly, it covers 46 of 342 (15 percent) of the National Assembly constituencies of Pakistan. We will match this data with the novel data on constituency-level political dynasties to identify potential mechanisms through which political dynasties could

[13] This data can be accessed at https://www.ifpri.org/publication/pakistan-rural-household-panel-survey-prhps-2014-round-3

[14] The data are fully representative of Rural Punjab and Sindh. However, some of the districts of KPK are not included in the sample due to the difficult law and order situation. Baluchistan and FATA are also excluded from the sample due to security concerns.

impact local economic development. Despite its limited coverage, it may provide suggestive evidence of these mechanisms. Table 3 reports summary statistics of some of the socio-economic and political variables from the PRHPS.

Table 2

Descriptive Statistics of Household & Village Socio-economic and Political Variables

Variables	Mean	S.D.	Min	Max
HH Public Services				
HH Infrastructure Index	0.434	0.264	0	1
Electricity	0.852	0.355	0	1
Flush Latrin	0.393	0.488	0	1
Pipe Drainage	0.429	0.495	0	1
Pipe Water	0.0606	0.239	0	1
Consumption (Rs.)	34588.65	41688.17	5410	117920
Land Wealth (Rs.)	224210.3	972842	0	4.62E+06
Non-Land Wealth (Rs.)	177462.9	350763.7	3000	5555200
HH Political and Trust Variables				
Cast Vote in 2008	0.844	0.363	0	1
Political Knowledge	0.413	0.440	0	1
Deomcoratic Preferences	2.910	0.843	1	5
Trust in Institutions	2.316	0.558	1	4
Village Public Services				
Village Infrastructure Index	0.446	0.293	0	1
Electricity	0.570	0.495	0	1
Sui Ga	0.0993	0.299	0	1
Telephone	0.247	0.431	0	1
Paved Road	0.371	0.483	0	1

Note: Household infrastructure index is the average value of household access to electricity, tap water, pipe drainage, and flush latrine, while, the village infrastructure index is the average value of village access to electricity, sui gas, telephone, and paved roads. Similarly, political knowledge is the average value of questions like know/name PM/CM, democratic preference is the average value of support for the democratic system, protection of civil and political rights, and trust in institutions is the average value of trust on police, judges, and local politicians.

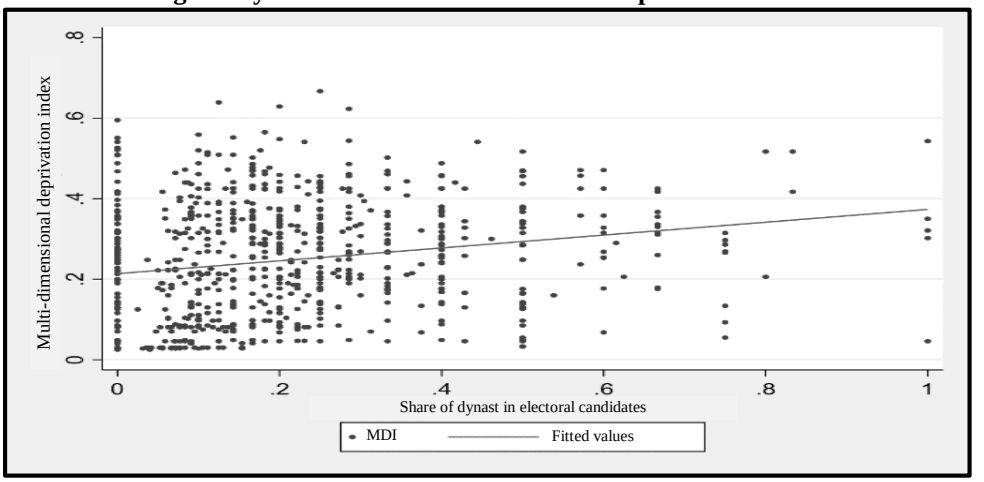
4. DYNASTIES, COMPETITION, AND DEVELOPMENT: SOME STYLISED FACTS

Before we move to formal empirical analysis, it is important to see some stylised facts about the connection between dynasties, political competition, and local economic development. This exploration is in line with the conceptional framework discussed in section, 2 and will set the base for the empirical result discussed in the next section.

We begin by looking at the relationship between the share of dynastic politicians in elections in a constituency and the multidimensional deprivation index (MDI) of the district where the respective constituency lies. Figure 5 shows that this relationship is positive. This suggests that constituencies with a higher share of dynast candidates are worse off compared to those will a lower share of these candidates. This provides the first

suggestive evidence that constituencies dominated by dynasts suffer from a lack of public good provisioning, indicating the fact the dynast underperforms in improving the welfare of their constituents.

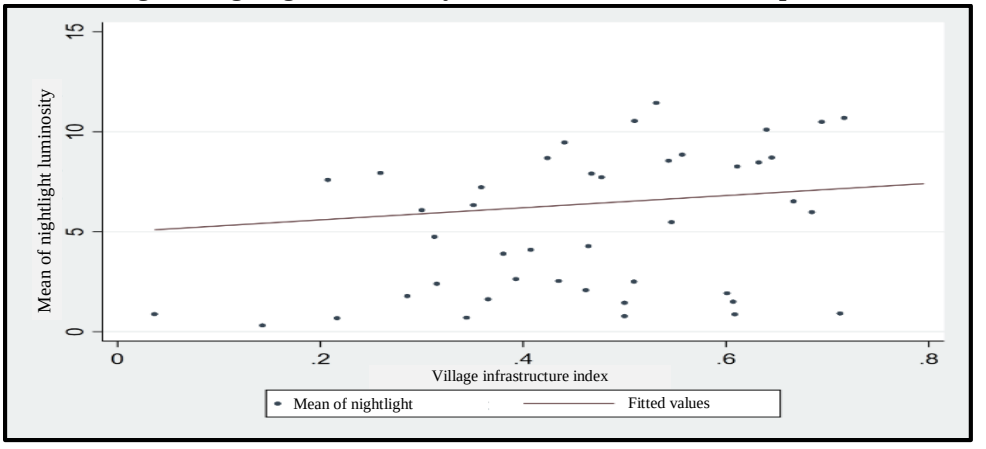
Fig. 5. Dynasties and Multidimensional Deprivation Index



Source: Authors' calculations.

But does domination of dynast candidates also impede local economic development? We discussed in the previous section that, due to the lack of data on economic growth at the constituency level, the nightlight luminosity is used as the proxy. It is, therefore, important to empirically verify how good of a proxy this is. Figure 6 shows the relationship between the village infrastructure index and the mean of nightlight luminosity. The infrastructure index is developed from the PRHPS. There is a positive relationship between the two suggesting that improved infrastructure is associated with a higher value of nightlights and vice versa. In other words, infrastructure development - an indicator for local economic development—can be evidenced by nightlight data.

Fig. 6. Nightlight Luminosity and Local Economic Development

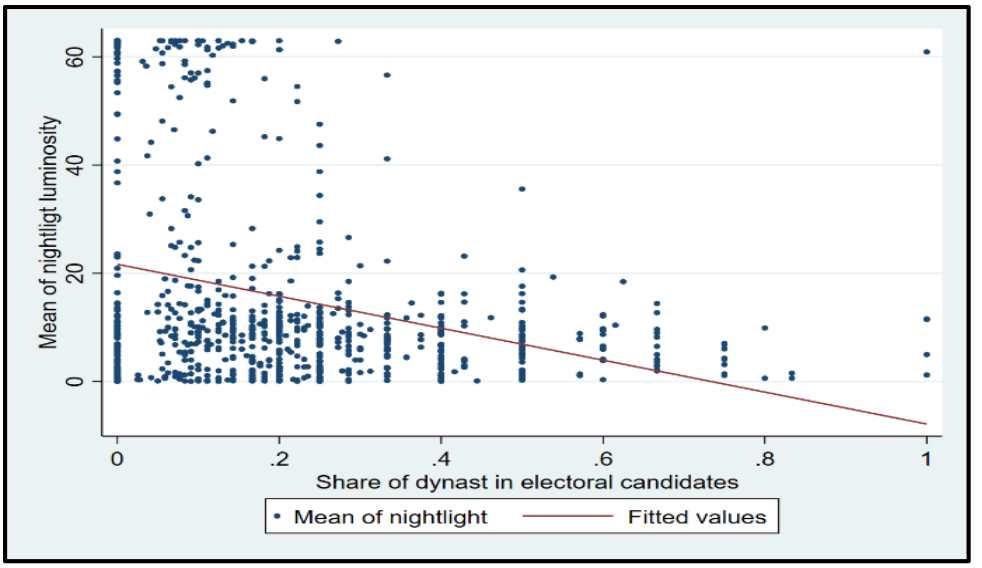


Source: Authors' calculations.

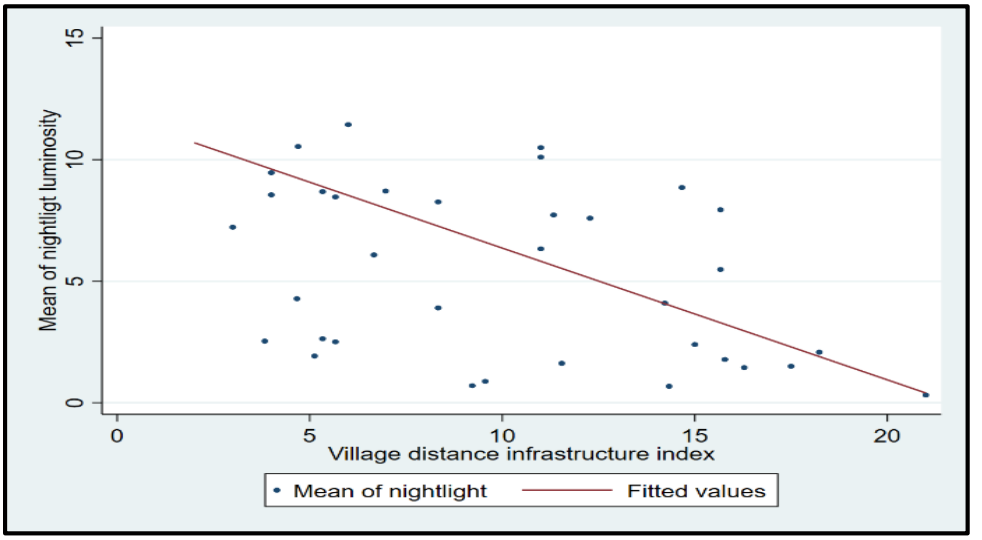
Next, we examine the relationship between local economic development and the share of dynasts in electoral candidates. A lower share of dynast candidates is associated with greater local economic development (Figure 7: Panel A). This invigorates the evidence in Figure 4 that constituencies ruled by dynasts have deteriorated public good provisioning which results in their lower economic development. This is further supported by Panel B (Figure 7) which shows that distance from institutions of public good provisioning such as schools, healthcare centers, etc., reduces the local economic development.

Fig. 7. Dynasties and Local Economic Development

Panel A

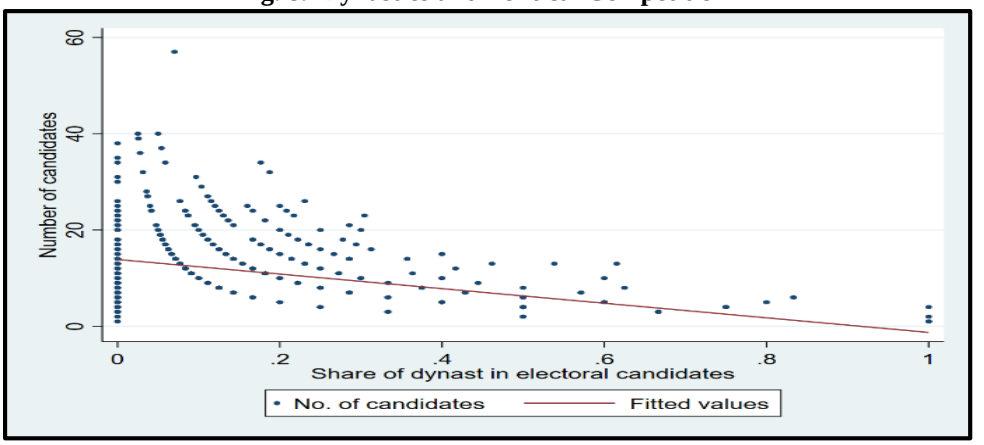


Panel A



The stylised facts shown above provide suggestive evidence that constituencies that are dominated by dynastic politicians are worse off in terms of economic development and the provision of public goods. The question, however, arises as that how that increased share of economic dynast candidates hinder economic development. The answer to this question lies in the political theory of economic backwardness advocated by Acemoglu and Robinson (2006b). As discussed in section 2, politicians who do have some control and power in their constituencies but also fear potential competition in the future would be lured into blocking innovation and reforms to prevent any political competition and being replaced eventually. The increase in the share of dynasts in electoral candidates reduces political competition. Non-dynast candidates believe that they would be able to defeat the dynast candidates due to the latter's political capital. The election campaign at the constituency level has also been made very costly despite assigning of maximum limit on the cost for these campaigns by the Election Commission of Pakistan (ECP). Figure 8 confirms the notion that an increased share of dynasts in candidacy for the office kills the political competition. In absence of any meaningful competition, the decedent dynasts have a lower incentive to deliver.

Fig. 8. Dynasties and Political Competition



5. IDENTIFICATION STRATEGY

A straightforward comparison between dynasts and non-dynast politicians is unlikely to be meaningful given that dynasts differ from non-dynasts significantly in terms of observable and unobservable characteristics (Querubin, 2011). Thus, a simple descriptive analysis or an Ordinary Least Squares (OLS) regression may not provide the causal effect of political dynasties on local development. These statistical techniques are constrained by reverse causality, a possibility where political dynasties might have emerged historically in less developed constituencies.

To overcome these challenges, previous work on political dynasties (Dal Bo, *et al.* 2009; Querubin, 2011; George & Ponattu, 2019) relies on close elections to isolate the effects of observable and non-observable candidate-specific characteristics on outcome variables. They examine close races where a dynast defeats a non-dynast with a small margin and vice versa. Such an empirical framework is appropriate in the context of the

above studies as the focus there is on the persistence of political dynasties. In other words, the above studies examine if close election winners are more likely to have their coming generations in political offices when compared to close election runner-ups.

Such a strategy of comparing winners and losers is not appropriate for the research question under study. Since we are interested to examine the economic performance of the political dynasty, candidates who lose elections are not likely to hold any political office and, therefore, it is not possible to measure their performance. Hence, an ideal strategy, in this case, is to compare one set of close election winners with another set of such winners. Accordingly, we compare the performance of dynastic members of national assembly (MNAs) who defeat non-dynastic candidates by a close margin with that of non-dynastic MNAs who defeat dynastic candidates by a similar close margin while using a Regression Discontinuity Design (RDD) (Galasso and Nannicini, 2011; Malik, et al. 2021). As winning an election by a close margin is likely to be random, the use of close elections as an identification strategy minimises the effects of observable and non-observable politicians' characteristics on the probability of winning an election. That is, the winners and runner-ups are almost similar in other characteristics and the win/loss is random in the sense that the results could have gone either way.

The RD set-up is created by multiplying the winning margin of non-dynasts by (–1) and leaving the winning margin of dynasts unaltered. This results in a continuous series of winning margins with non-dynasts being represented by negative numbers and dynasts by positive numbers. This modified margin is then used as the running variable with zero being the cutoff. In effect, this RD design compares outcome (local economic development) between dynast MNAs who defeated non-dynast runner-ups with a narrow margin of close to zero and non-dynast MNAs who defeated dynasts candidates with a similar margin.

Our empirical RD specification is given as follows:

$$Y_{ct} = \beta_0 + \beta_1 Dynast_{ct} + \beta_2 Victory\ Margin_{ct} + \beta_3 (Dynast * Victory\ Margin)_{ct} + \gamma X_{ct} + \theta_d + \varepsilon_{ct} \quad \ldots \quad (1)$$

Where Y_{ct} represents the local economic development at the constituency level c at time t (2002-2013); $Dynast_{ct}$ takes the value 1 if the elected MNA is from a dynasty and zero otherwise during the period 2002 to 2013; $Victory\ Margin_{ct}$ shows the margin of victory of a dynast over non-dynast and vice versa; X_{ct} represent a constituency and candidate-specific characteristics that are included as control variables in Equation (1); and θ_d controls district fixed effects.

In Equation (1), β_1 is the coefficient of interest, which measures the mean difference in the outcome variable (economic development), Y_{ct}, between constituencies where a dynast narrowly wins an election and constituencies where a dynast narrowly loses to a non-dynast candidate. Specifically, β_1 measures the average difference in the mean and growth of nightlight luminosity (economic development) between the two types of constituencies.

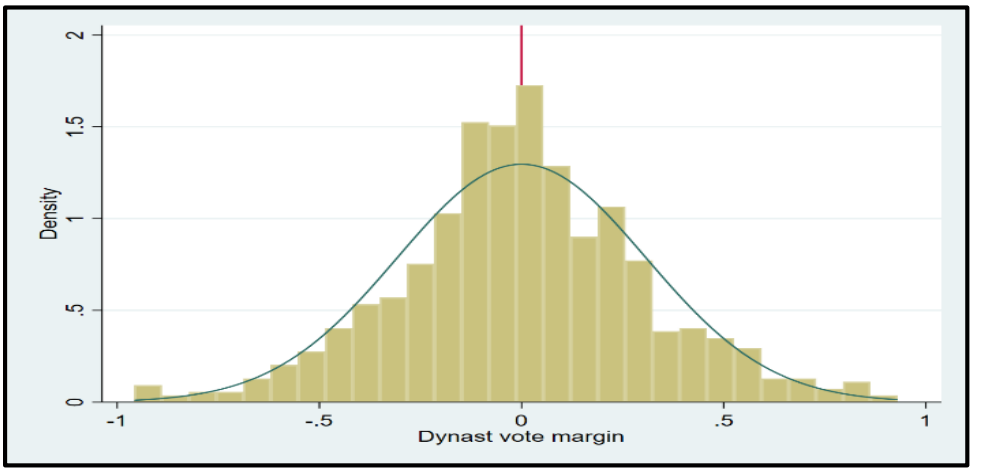
One of the concerns with the validity of the RD design is the manipulation of the treatment variable at the cut-off. In our case, there may be a possibility that the electoral system is being manipulated by dynastic politicians in ways that increases their probability of winning. If this was the case, we should observe a discontinuity in the density of the running variable (dynast victory margin) at the cut-off. Visual inspection of Figure 9 reveals no discontinuity/manipulation of the forcing variable at the cut-off zero.

Panel A (Figure 9) depicts the simple distribution of the dynast vote margin at the cut-off while Panel B (Figure 9) provides a 95 percent confidence interval around the distribution of dynast vote margin.[15]

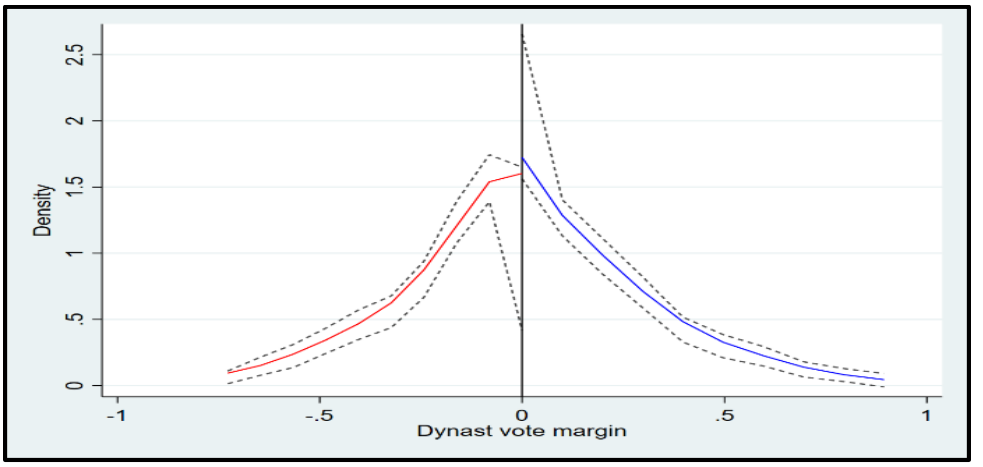
The other concern with the validity of the RD is the discontinuity of control variables at the cut-off line. If constituency and candidate-specific characteristics change discontinuously at the cut-off line, the RD design may not give valid estimates. In this context, Table 4 shows the difference in means in covariates between dynast and non-dynast ruling constituencies between 2002-2013. It reveals that except for the nightlight mean, there is no statistically significant difference among other covariates.

Fig. 9. Density of the Daynst Politician Vote Margin (i.e., Forcing Variable)

Panel A



Panel B



[15] To detect discontinuity in the running variable (dynast vote margin) around threshold value of zero, we also perform Cattaneo, et al. (2018) test. Its t-value (0.43) and p-value (0.67) do not reject constinuity at the cut-off, i.e, no systematic electoral manipulation by dynsts are observed which affects their chances of winning.

Table 4

Difference in Control and Covariates between Dynast and Non-Dynast Constituencies

Variables	Dynast	Non-Dynast	Dynast-Non-Dynast
Mean of Night Lights	12.26	19.07	–6.803***
			[1.345]
Turnout	45.94	47.72	–1.773
			[1.491]
Ruling Party Legislator	0.71	0.61	0.100*
			[0.056]
Vote Share of Incumbent Candidate	0.16	0.15	0.015
			[0.022]
Vote Share of Idependent Candidates	0.08	0.11	–0.029
			[0.020]

Note: This table provides descriptive statistics on some of the constituency and candidate specific characteristic which may affect the outcome variable. ***p < 0.01; **p < 0.05; *p < 0.1

6. RESULTS AND DISCUSSION

Using Equation (1), we estimate the impact of dynastic politicians, who narrowly won elections from non-dynast politicians, on local economic development. We start by presenting the results of our main indicator of local development, i.e., constituency level mean and growth in nightlight luminosity between 2002 and 2013. Furthermore, we also estimate the effect of a dynastic politician winner on household and village level indicators of development including provision of public services (electricity, education, health, road, etc.), private consumption and assets holding, and trust in institutions.

6.1. Graphical Evidence of Discontinuities

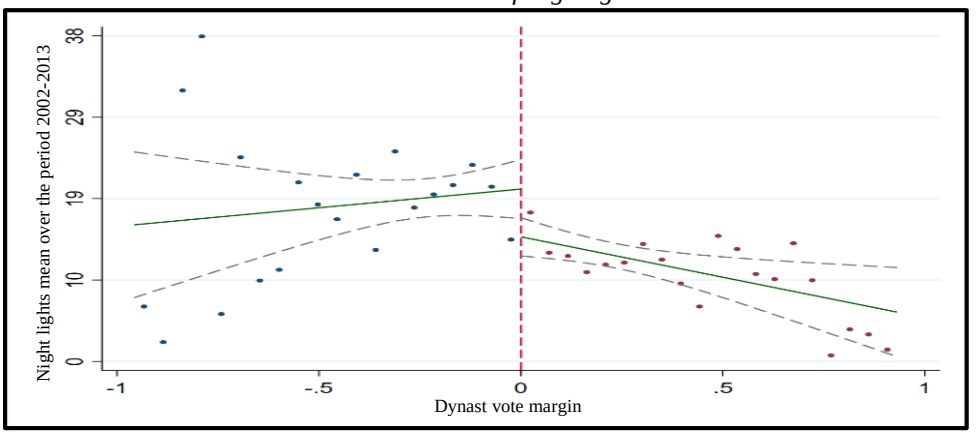
Figures 10 & 11 provide visual evidence of discontinuity in nightlight luminosity based on equation (1) at both national and provincial levels, respectively. The left side of the graphs depicts discontinuity in the *mean* of nightlight luminosity in a five-year election cycle, i.e., 2002, 2008, and 2013. Similarly, the right-side of the graphs visualise discontinuity in the growth of nightlight in an election cycle, 2002-2008 and 2008-2013. Furthermore, within a graph, points on the right of the cut-off, i.e., 0 line, represent the margin of victory of dynastic candidate over the non-dynast runner-up, and on the left of cut-off, a dynast narrowly lost to non-dynast.

Figure 10 provides a clear discontinuity in both mean (Panel A) and growth (Panel B) in nightlight luminosity on locations on either side of the cut-off line. Specifically, locations on the right of the cut-off have lower mean and growth in nightlight relative to locations on the left of the cut-off. Similarly, Figure 11 visualises discontinuities in the mean and growth of nightlight at the provincial level. An interesting discontinuity is that of the province of Khyber Pakhtunkhwa (Panel C: Figure 11) where a dynastic rule has a positive effect on nightlight mean and growth over time.[16]

[16] Khyber Pakhtunkhwa is the only province where incumbent political parity has never won an election except in 2018. This behavior of voters might have created incentives for the dynast politicians to perform on local development indicators.

Fig. 10. Nightlight Luminosity and Dynast Vote Margin at the National Level

Panel A: Mean of Nightlight



Panel B: Growth of Nightlight

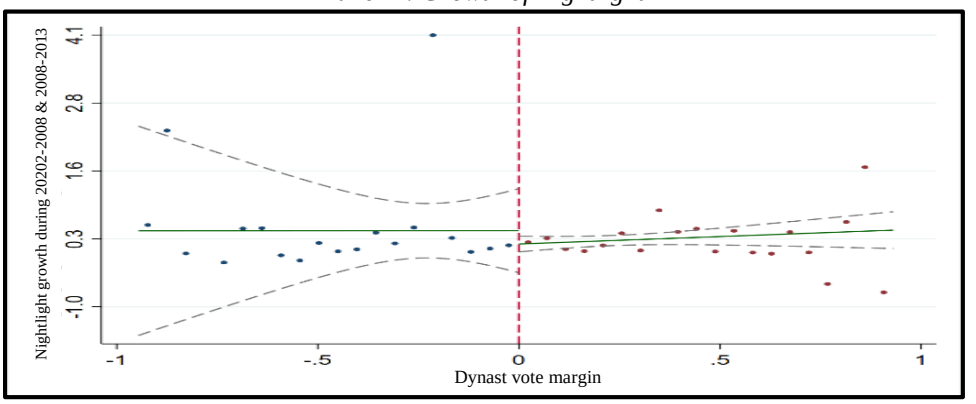
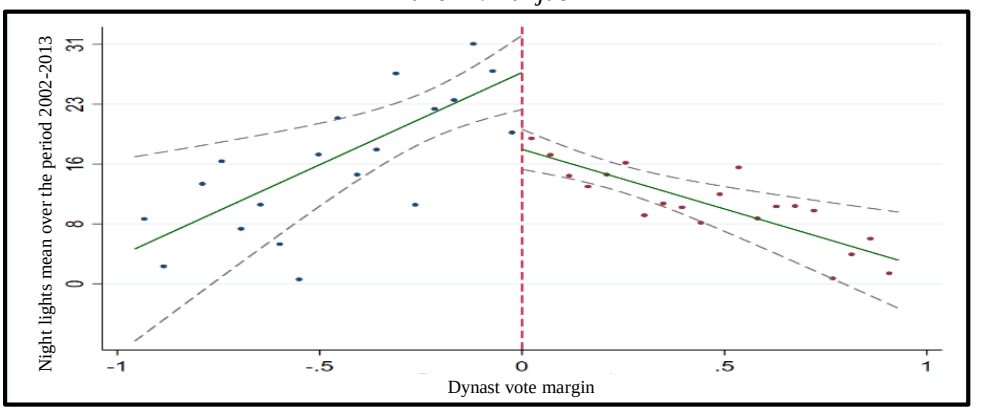
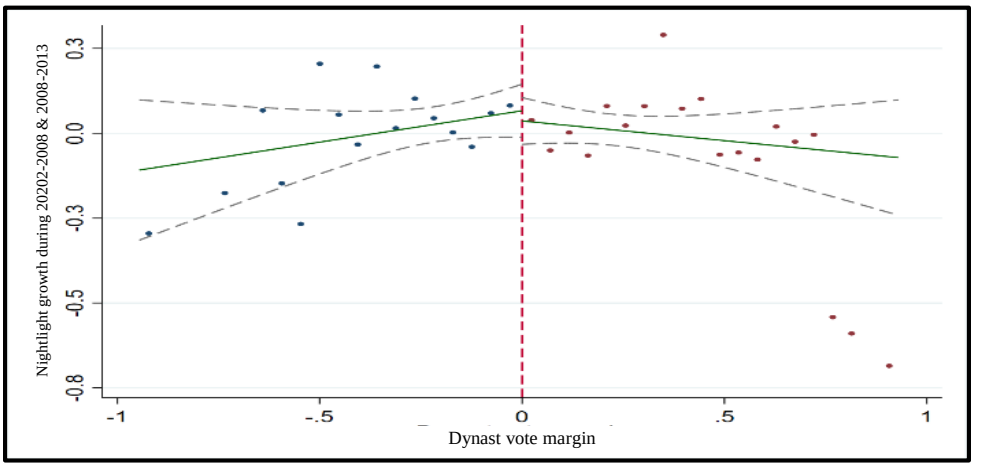


Fig. 11. Nightlight Luminosity and Dynast Vote Margin at the Provincial Level

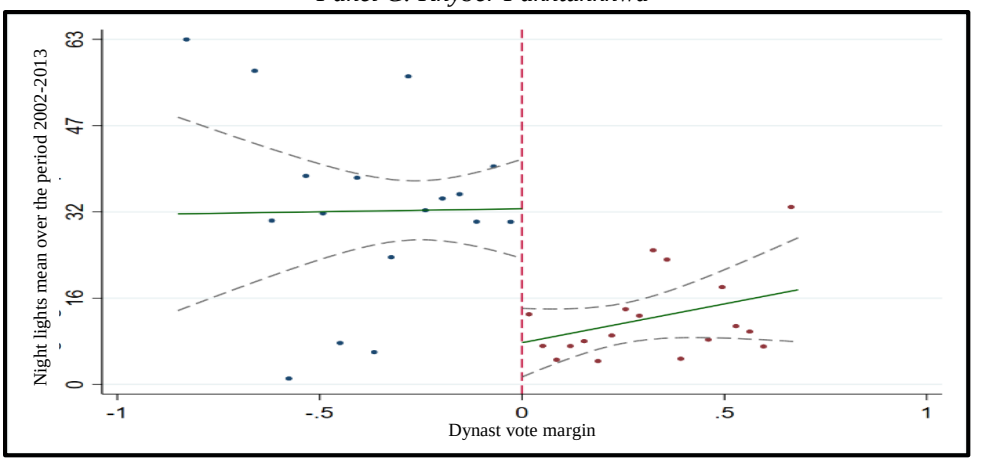
Panel A: Punjab

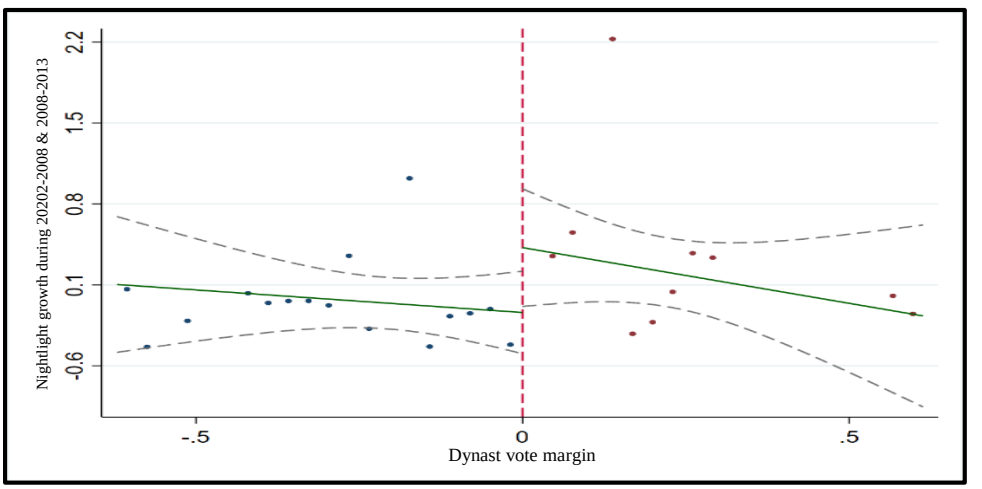


Panel B: Sindh

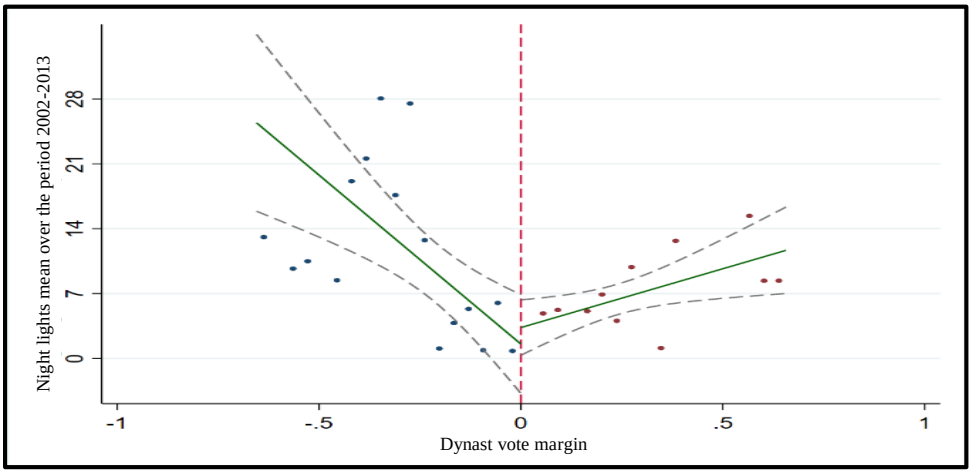


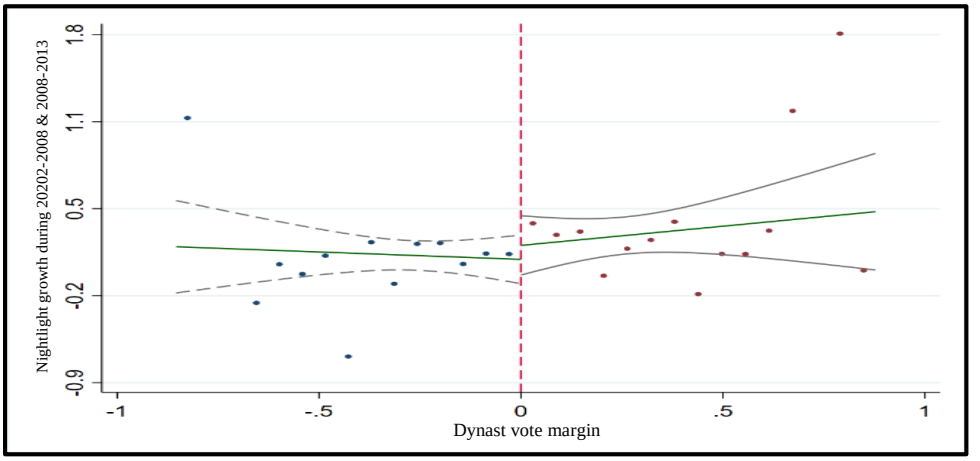
Panel C: Khyber Pakhtunkhwa

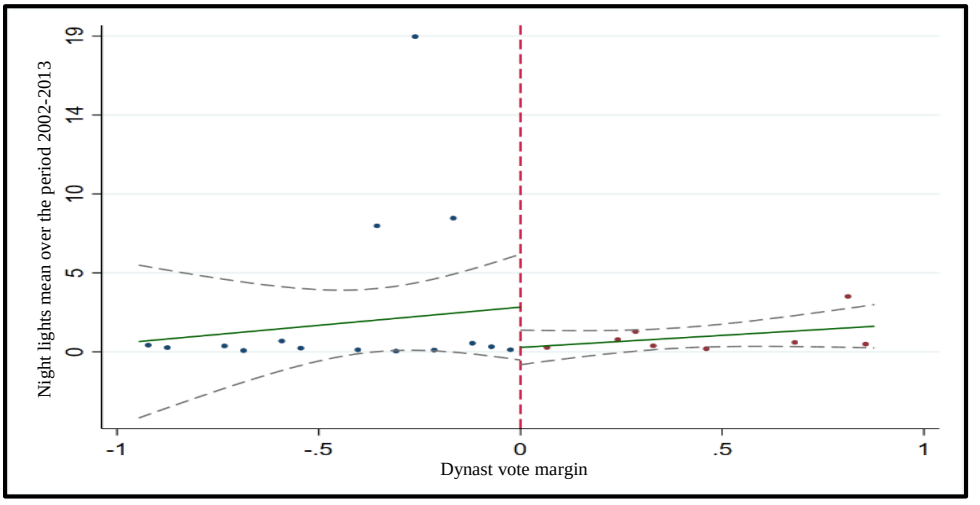


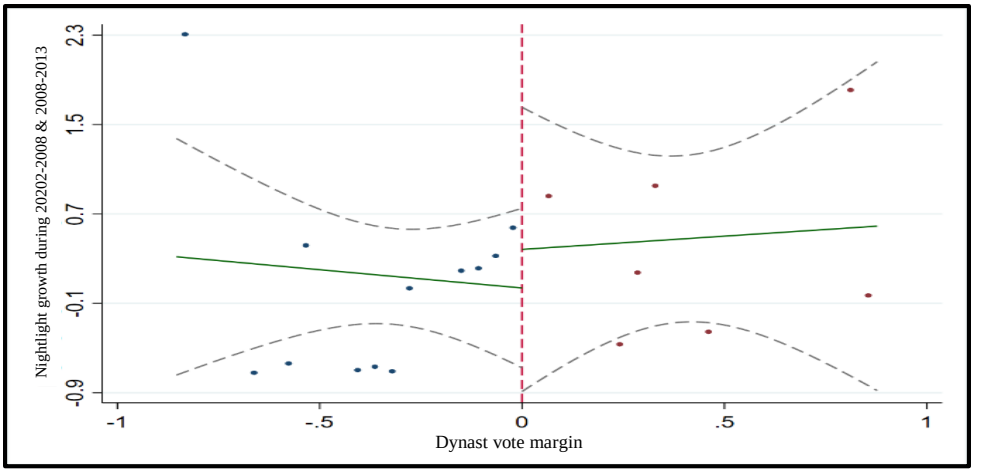


Panel D: Balochistan









6.2. Regression Discontinuity Estimates

Table 5 presents results from the constituency-level RD. All the regression specifications include district and time-fixed effects. The district fixed effects control for unobserved district-level factors that affect local economic development. Similarly, time-fixed effects control for time shocks that affect development in all constituencies over time. The regression specifications also include constituency-level and candidate-specific characteristics like turnout, ruling party legislator, voter share of the incumbent candidate, the number of independent candidates, age of the candidate, and a number of terms a candidate won an election. Furthermore, we also perform regression analyses for different RD bandwidths to minimise the effect of politicians' specific characteristics on the outcome variable.

Column 1 provides the effect of a dynastic legislator on nightlight growth for the whole sample. It shows that a constituency where a dynastic politician won an election has 0.97 percentage points less electricity as compared to a constituency that is won by a non-dynast politician. To minimise the role of politician-specific characteristics on nightlight growth, columns 2-4 report estimates for those elections which are won/lost by a dynastic politician by a margin of 3 percent, 5 percent, and 7 percent, respectively. The effect size of the coefficients is almost the same in these bandwidths; however, the statistical significance decreases for a bandwidth of 3 percent.

Quantitatively, a one percentage point is approximately the difference in growth in nightlight between a constituency at the 50th percentile of the nightlight growth distribution and a constituency at the 5th percentile. It is approximately equal to a difference in nightlight growth between constituencies in the districts of Gujrat and DG Khan; Haripur and Lakimarwat; Tando Ala Yar and Tharparkar; and Quetta and Loralai.

Similarly, Table 6 provides estimates of the effect of a dynastic ruler on nightlight growth at the provincial level. Khyber Pakhtunkhwa and Baluchistan estimates are not reported because of the low number of effective observations. Table 6 reveals that a dynastic winner reduces the growth of constituency level nightlight in Punjab by 0.30 percentage points which is approximately the difference between nightlight growth of Jhang district (77th nightlight percentile distribution) and Bahawalpur (50th percentile).

Similar estimates are observed in the province of Sindh where dynastic winner decreases the growth of nightlight by 0.25 percentage points, i.e., a difference between the growth of nightlight in Larkana and Tharparker.

Table 3

Effect of Dynastic Legislator on Nighttime Luminosity Growth at National Level

	(1)	(2)	(3)	(4)
Dynastic Legislator	–0.974**	–0.956*	–0.934**	–1.041***
	(0.459)	(0.513)	(0.456)	(0.398)
RD Bandwdith	Full Sample	3%	5%	7%
Specification	Local Linear	Local Linear	Local Linear	Local Linear
Control Variables	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	320	156	192	211

Note: The table estimates the specification in equation (1). The dependent variable Y_{ct} is growth in nightlight luminosity during the electoral cycle in which a candidate is elected (e.g., between 2002 and 2008 for a candidate elected in 2002). The control variables include turnout, ruling party legislature, the vote share of the incumbent candidate, the vote share of the independent candidates, age of the candidate, and the number of terms a candidate won an election. Standard errors are reported in parentheses which are clustered at the district level. ***p < 0.01; **p < 0.05; *p < 0.1.

Table 6

Effect of Dynastic Legislator on Nighttime Luminosity Growth at Provincial-Level

	Punjab	Sindh	KPK	Balochistan
Dynastic Legislator	–0.295**	–0.251*	–	–
	(0.148)	(0.135)	–	–
			–	–
Bandwith	Full Sample	Full Sample	–	–
Specification	Local Linear	Local Linear	–	–
Control Variables	Yes	Yes	–	–
District FE	Yes	Yes	–	–
Time FE	Yes	Yes	–	–
Observations	165	87	–	–

Note: The table estimates the specification in equation (1). The dependent variable Y_{ct} is growth in nightlight luminosity during the electoral cycle in which a candidate is elected (e.g., between 2002 and 2008 for a candidate elected in 2002). The control variables include turnout, ruling party legislature, the vote share of the incumbent candidate, the vote share of the independent candidates, age of the candidate, and the number of terms a candidate won an election. Standard errors are reported in parentheses which are clustered at the district level. ***p < 0.01; **p < 0.05; *p < 0.1.

6.3. Robustness

As discussed in the previous sections that nightlight luminosity is highly correlated with different measures of economic development. However, due to widespread load-shedding in Pakistan since 2008, nightlight intensity may not capture the actual correlation with economic activities at the constituency level. Furthermore, the intensity

of electricity shortages was significantly higher in rural constituencies than in urban. Similarly, landholding had played a significant role in the creation of dynastic families in Pakistan (Malik, et al. 2021). Restricting the analysis to rural constituencies with various indicators of local development would not only provide the actual effect of dynastic politics on economic development but also will test the validity of the nightlight as a proxy for economic and human development.

For this purpose, we utilise information on various socio-economic and political variables at household and village levels from rounds 1 and 1.5 of the Pakistan Rural Household Panel Survey (PRHPS). The survey was conducted in 2012 and 2013 in rural areas of three provinces. Therefore, we match the survey information to the rural constituencies of the 2008 election where a dynast won/lost the election. Furthermore, the survey collected rich information on different dimensions of household and village economic variables including access to electricity, gas, schools, hospitals, road, etcetera. The regression estimates based on the PRHPS survey are reported below.

In this analysis, the dynastic legislator is a dichotomous variable that takes the value 1 if the dynast had won the 2008 election and 0 otherwise. Table 7 reports the regression estimates of the effect of the dynastic winner in 2008 on household and village levels infrastructure indicators (public services) in 2012.[17] It shows that a dynastic legislature has a significantly negative effect on the household public services. Similarly, the estimates are statistically robust when we control the respective regressions for covariates and district fixed effects. Households in the constituency of a dynastic winner have access to fewer public services, i.e., 0.107, than non-dynast constituencies. This value is approximately equal to 10 percent of the infrastructure index. Similarly, villages under a dynastic ruler have 0.25 (25 percent) less public services than the non-dynast constituencies.

Table 7

Dynastic Legislator and Household/Local Infrastructure

	HH Infrastructure Index	Village Infrastructure Index
Dynastic Legislator	–0.107***	–0.253**
	(0.038)	(0.119)
Control Variables	Yes	Yes
District FE	Yes	Yes
R-squared	0.778	0.592
Observations	1,729	176

Note: The dependent variable is the infrastructure index which is calculated as the average values from access to electricity, tap water, pipe drainage, and flush latrine at the household level. Similarly, the village infrastructure index is an average value of access to village electricity, sui gas, telephone, and paved roads. Control variables include household size, marital status, education, ethnicity, employment status, wealth, distance to school, health centers, market, and city. Standard errors are reported in parentheses which are clustered at the village and tehsil levels, respectively. ***p < 0.01; **p < 0.05; *p < 0.1.

[17]Household infrastructure index is the average value of household access to electricity, tap water, pipe drainage, and flush latrine, while, the village infrastructure index is the average value of village access to electricity, sui gas, telephone, and paved roads.

Similarly, we regress individual variables in the infrastructure index, i.,e, household access to public services like electricity, flush latrine, drainage system, and piped water on having dynastic legislature in the constituency. The results are reported in Table 8 which reveals that the constituencies where a dynastic politician won the 2008 election had less access to the above public services in 2012 than a non-dynast constituency. Interestingly, the effect of the dynastic legislature is significantly high on the magnitude of the electricity provision than other public services which also validate the results based on nightlight luminosity.

Table 8

Dynastic Legislator and Household Level Public Services

	Electricity	Flush Latrin	Piped Drainage	Piped Water
Dynastic Legislator	–0.231***	–0.058	–0.106**	–0.163***
	(0.062)	(0.104)	(0.040)	(0.055)
Control Variables	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
R-squared	0.464	0.221	0.416	0.381
Observations	1,732	1,730	1,730	1,730

Note: The dependent variable is the access to electricity, tap water, pipe drainage, and flush latrine at the household level. Control variables include household size, marital status, education, ethnicity, employment status, wealth, distance to school, health centers, market, and city. Standard errors are reported in parentheses which are clustered at the village level. ***p < 0.01; **p < 0.05; *p < 0.1.

Furthermore, we also estimate the effect of a dynastic legislature on different types of individual public services at the village level. Table 9 shows that villages in the constituencies of the dynastic legislature have significantly lower public service provisions than non-dynast legislature villages. In line with the results of household public services, the effect on electricity provision is the highest than on other public services.

Table 9

Dynastic Legislator and Village Level Public Services

	Electricity	Sui Gas	Telephone	Paved Roads
Dynastic Legislator	–0.285**	0.172***	–0.109**	–0.110***
	(0.119)	(0.067)	(0.051)	(0.043)
Control Variables	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
R-squared	0.563	0.664	0.808	0.712
Observations	176	176	176	176

Notes: The dependent variable is the access of a village to electricity, sui gas, telephone, and paved roads. Control variables include village distance to school, health centers, market, and city. Standard errors are reported in parentheses which are clustered at the tehsil level. ***p < 0.01; **p < 0.05; *p < 0.1.

Next, we investigate the effect of the dynastic winner on household consumption and wealth level, which are in natural logarithmic form. Table 10 reveals that constituencies with a dynastic legislator exhibit a significantly lower value of household consumption and wealth. The household in constituencies where a dynast wins have 21 percent lower consumption than non-dynast winner constituencies.

Table 10

Dynastic Legislator and Household Consumption and Wealth

	Consumption	Land Wealth	Non-Land Wealth
Dynastic Legislator	–0.206**	–0.972***	–0.552***
	(0.087)	(0.280)	(0.166)
Control Variables	Yes	Yes	Yes
District FE	Yes	Yes	Yes
R-squared	0.298	0.317	0.291
Observations	1,731	744	1,733

Notes: The dependent variable is the log of consumption, land, and non-land wealth at the household level. Control variables include household size, marital status, education, ethnicity, employment status, distance to school, health centers, market, and city. Standard errors are reported in parentheses which are clustered at the village level. ***p < 0.01; **p < 0.05; *p < 0.1.

6.4. Potential Mechanisms

Finally, we provide some evidence on the potential channels through which a dynast may have less incentive to consider the local development of its constituency. One of the mechanisms could be low political preferences in constituencies where a political dynastic family exists. Political preferences can be proxied in the form of casting votes in an election, political awareness, and support for democratic processes. Political science literature on political dynasties reveals that due to political networking, brand name advantage, loyal voters, etc., a low electoral turnout in a constituency increases the likelihood of a dynast winning (Geys, 2006; Dar, 2019). Due to the loyal voters of the dynast, its constituency is likely to have low political knowledge and awareness. These characteristics of the voters favor a dynast as they may not vote based on economic performance and public service delivery of the dynast but purely on loyalty and political connections.

Similarly, Malik, et al. (2021) studied in Punjab that voters in the constituency of an entrenched political dynasty have lower trust in formal institutions. They have a high tendency to solve their dispute through informal institutions through local elites (dynasts). Therefore, they may have less incentive to reform formal institutions.

Table 11 presents that voters in the constituency of a dynast legislature, who had won the 2008 election, have less political knowledge, lower democratic preferences, and are less likely to cast vote in 2012. Similarly, voters in these constituencies exhibit lower trust in formal institutions. This means that the presence of a dynast in the office is associated with the deteriorated trust of constituents in the system. This happens when the voters are not satisfied and do not expect better institutional performance in public service provisioning from their officeholders.

Table 11

Dynastic Legislature and Voters Political and Social Behavior

	Voted	Political Knowledge	Democratic Preferences	Trust on Institutions
Dynastic Legislator	–0.101***	–0.098**	–0.096**	–0.107**
	(0.028)	(0.042)	(0.038)	(0.048)
Control Variables	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
R-squared	0.027	0.169	0.214	0.276
Observations	1,707	1,707	1,707	1,691

Notes: The dependent variable is vote casting in the 2008 election, political knowledge is the average value of questions like know/name PM/CM, democratic preferences is the average value of support for the democratic system, protection of civil and political rights, and trust on institutions is the average value of trust on police, judges, and politicians at the household level. Control variables include household size, marital status, education, ethnicity, employment status, wealth, distance to school, health centers, market, and city. Standard errors are reported in parentheses which are clustered at the village level. ***p < 0.01; **p < 0.05; *p < 0.1.

7. CONCLUSION AND POLICY IMPLICATIONS

This study explored the impact of dynastic persistence on local economic development and public service provisioning. The findings suggest that constituencies with non-dynasts winners perform better than the dynast winners in terms of local economic development. Moreover, constituencies with non-dynast winners have better public service provisioning. They have improved water and sanitation facilities, better infrastructure in terms of roads, and significantly higher access to services such as electricity, gas, telephone. Furthermore, non-dynast constituencies have significantly higher consumption and assets. The potential reason for the worse performance of dynasts could be associated with (i) lower political competition, and (ii) a lack of trust in democratic institutions by the voters. In the absence of political competition, the dynast has little incentive to perform. They rely on their political or campaigning capital (e.g., a prominent name or a powerful network) to win the elections and remain in power. This leads them to put less effort which results in underperformance. Moreover, lack of trust in political institutions reduces political participation which in turn discourages political competition and therefore public service provisioning.

The disaggregated analysis shows that dynasts are lagging in performance holds for all provinces except Khyber Pakhtunkhwa (KP). This is an interesting diversion but makes perfect sense. Historically speaking, the voters in KP evaluate the candidates based on their performance and not on political capital. This is evident from the fact that almost all political parties have been given the chance to rule in the province but were voted out in the next election when they did not perform. Whether or not the candidates are from dynast families did not matter to them. The candidates from dynasties know this and therefore they try to improve local economic development and public service provision to consolidate their position.

Based on the findings in this study, the following policy recommendations are suggested:

- It is important to mention that the scope of this study was to explore performance in terms of local economic development. We did not evaluate how a dynast or non-dynast politician performs in the assembly through participation in legislation and other functionings of the parliament (which is the primary role of a parliamentarian). The debate about economic performance between dynast and non-dynast politicians would be irrelevant if they are spared from this responsibility. This can be done by (i) abolishing discretionary funds allocated to members of the parliament and (ii) reducing their influence in the allocation of the Public Sector Development Programme (PSDP). This is the responsibility of the parliament to debate and implement this recommendation.
- The funds should instead be allocated to local government as local economic development is primarily the role of this tier of government.[18] This will incentivise contesting elections at the local (village/union council) level thereby increasing political participation and competition. The accountability of locally elected representatives will improve transparency which will ensure better economic development at this level. As per the constitution, the provincial governments should be responsible for implementing this suggestion.
- Until the above recommendations are implemented, the discretionary funds allocated to members of the parliament should be institutionalised by putting to audit and other accountability criteria set up by the Planning Commission of Pakistan.
- To our knowledge, this is the first scientific evidence at the national level about the comparison of economic performances of dynast and non-dynast politicians. This should generate a debate among academics, civil society, politicians, and more importantly among the voters. This study should be widely circulated among key stakeholders for debate and coming up with better suggestions to improve the system. Media can play an important role in creating awareness among voters about the office holders' performance and founder and descendant effects.

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[18] This tier is protected by the constitution in Article 32 and 140-A.

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Skills Mapping for Selected Industries of Special Economic Zones: Job Creation for Unemployed Youth of Balochistan

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We examined identifying the TVET institutional framework, mapping TVET skills, and estimating the available and potential jobs creation by selected nine industries of special economic and export processing zones (SEZs/EPZs) of Balochistan. Three field visits, three focus group discussions, and 20 plus key informant interviews via mixed research methods are conducted for mapping skills about the three categories of existing, proposed, and potential industries of Balochistan. The study results show that the provincial TVET system is underdeveloped to break-even the supply and demand gaps in technical, vocational, common, and specific TVET skills. The provision of relevant TVET skills may potentially develop skilled human resources to break-even the current and futuristic jobs creation and employment opportunities for the bulge of unemployed youth of Balochistan. The study is relevant to pinpoint some policy options for skill-based human resource development endeavours in the context of ongoing industrial development proposed for SEZs/EPZs of Balochistan.

JEL Classification: J2, J21, J24, J62, O15, L00

Keywords: Employment, Industrial Development, Jobs Creation, SEZs/EPZs, Skills Mapping, Technical Skills, Vocational Skills, Youth Development

1. INTRODUCTION

The human resource development (HRD) is concerned with providing workers with the basic knowledge and expertise required for their job responsibilities in the labour market. Investment in education is considered the foremost important factor for the HRD which can ensure economic growth and development. The human capital theories (HCTs) of Becker (1964), Mincer (1974), and Schultz (1974) emphasise investment in human capital formation for personal returns, overall economic growth, and development. Both the general and technical and vocational education and training (TVET) are considered as investment in education as per insights packaged in HCTs.

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In contrast to theoretical nature of general education, the TVET is an applied version of the general education system (Khan and Ahmed, 2019; Alvarado, 2017; Silva, 2022). The Government of Pakistan announced its first-ever National TVET Policy (2015) having eight objectives for skills development across the country. For this purpose, the provincial technical and vocational training authorities (TEVTAs) are made functional to regulate, strengthen, manage, and centralise the diversified and distributed nature of TVET supply. At the national level, the National Vocational and Technical Training Commission (NAVTTC) under the Federal Ministry of Educational and Professional Training (FMEPT) is also established for commissioning the overall TVET sector in Pakistan. To ensure international best practices in the TVET sector and international acceptability of the TVET certificates and diplomas of Pakistan, NAVTTC has launched a quality framework of the National Vocational Qualification Framework (NVQF) to promote competency-based training and skills development that is in line with international standards of vocational and technical adroitness and professionalism (NAVTTC, 2020, B-TEVTA, 2020; P-TEVTA, 2021; Ahmed, et al. 2018).

Regarding jobs creation, the empirical studies of Dassel, Eckermann & Barclay (2013) and Ciżkowicz, et al. (2017) showed that millions of jobs were created in the SEZs of the Middle East, North Africa, and Poland, which provides evidence of job creation and increased employment opportunities through the establishment of SEZs. The Cambodian case of SEZs reported by War and Menon (2016) is also evidence to support the argument that industrialisation creates jobs. In this case, about 68,000 jobs for technical and vocational skilled labour were created with higher wages.

The literature suggests that the TVET skills provision mechanisms are run in line with the industrial development both in the developed and developing states of the world (Silva, 2022). For proper and effective industrial development, the role of vocational training and technical education must be empirically sorted for every new start-up of industrial development, especially in case of developing and poor regions of the world (ADB, 2014; Sudira, 2019). In addition, the occupational segregation of the labour force is also done as per the required skills in different industries (ILO, 2020). In Bangladesh, the announcement of the 100 SEZs programme got approval in its Seventh Five-Year Plan following the Bangladesh Economic Zones Act, 2010. This SEZ programme was aimed at achieving regional growth, human resource development, skills formation among unskilled labour, and the development of backward and lagging regions of the country. It was also aimed at reducing regional poverty and enhancing exports of the country. It is reported that millions of jobs are created for skilled labour force of Bangladesh and other South Asian Economies (Razzaque, et al. 2018). The Indian case of establishing SEZs also endorses technical and vocational education and training to ensure job creation, employment generation, and robust economic growth through industrial development. The SEZs Act-2005 has played an active role in building policy options for skill-based jobs creation and human resource development (Nallathiga, 2007).

In case of Pakistan, the PhD thesis of Khilji (2011) mentions that technical and human skills are necessary for jobs creation and industrial growth. The case of Pakistan for the last 60 years can be seriously investigated to know the extent and nature of skills development according to the needs of industrial development. Similarly, the literature and reports on the TVET sector of Balochistan provide no evidence that the TVET skill

provision is based on a proper categorisation of industries (Ahmed & Khan, 2019; Vision-2025, 2015). Currently, the manufacturing sector of Balochistan employs negligible (less than 2.5 percent) of provincial labour force due to lack of TVET skills provision to target industrial labour needs in Balochistan (LFS, 2017-18). Moreover, not having a TVET-based human resource policy for unemployed provincial youth may increase the chances of more unemployment, social unrest, and socio-economic miseries to likely disrupt the promise of a prosperous life for youth bulge of Balochistan (Khan and Ahmed, 2018; Ahmed and Khan, 2019).

To fill the research gap, this study will map TVET institutional set-up for skills development. Next, the study will map the industrial demand for technical, vocational, common, and specific TVET skills and will estimate job creation in selected nine industries of SEZs/EPZs in the province. This study is an attempt to map TVET skills and give policy implications for human resource planning in the context of industrial set-ups of SEZs/EPZs for the unemployed youth of Balochistan.

2. METHODOLOGY AND DATA

2.1. Research Design

The research design is composed of mixed research method and its components of focus groups discussions (FGDs), field surveys, key informant interviews (KIIs), identification of nine selected industries, identifying the provincial TVET system, and other data collection efforts following Wheeldon (2010), Williams (2007) and Khan & Ahmed (2019) for the objectives of this study.

2.2. Research Methodology

The research methodology contains two main components (i.e., a desktop survey and a field survey) and each component contains different phases. The desktop and field surveys were conducted in different phases (Wheeldon, 2010; Williams, 2007; Ahmed & Khan, 2019). The second component consists of field surveys, based on both the simultaneous and sequential phases of research methodology, of mixed research methods. These phases included three field visits to Bostan, Hub, and Gwadar SEZs/EPZs and their industrial setups. Three focus group discussions (FGDs) were also conducted for the study. Meetings with heads of departments (HoDs) for KIIs were also held.

2.3. Tools of Data Collection

Five research questions based on research objectives were used for getting information and data in three FGDs for SEZs/EPZs of Bostan, Hub, and Gwadar. For mapping the lists of different categories of TVET skills, the lists of vocational/technical and common/specific skills required by a specific industry are based on inputs from human resource offices and/or KIIs from HoDs of the selected industries. The mapping of TVET skills was also tallied with the occupational skill sets of ILO (2019), UNEVOC (2016), and NAVTTC (2019), which were confirmed by the KIs in selected industrial units. For doing so, the studies of Ahmed (2019), Khan & Ahmed (2019), ILO (2019) and UNEVOC (2016) were followed.

2.4. Respondents

The respondents of this study were key informants (KIs) from B-TEVTA, TVET departments, NAVTTC, the Board of Investment, chambers of commerce of relevant districts, GIZ, authorities of SEZs/EPZs, investors, TVET implementers, TVET institutes, TVET NGOs/INGOs for FGDs, TVET qualified individuals in labour markets.

2.5. Defining Skills for this Study

Within the broader context of skills conceptualisation, this study has divided the skills into four categories for selected industries in SEZs/EPZs of Balochistan.

2.5.1. *Vocational Skills*

Vocational skills are those skills that apply to a practical profession or work required. The duration of vocational training is from three months to twenty-four months disseminated and regularly given by TVET and allied departments in Balochistan (I&CD, 2021; NAVTTC, 2021; B-TEVTA, 2021; SWD, 2021; Subrahmanyam, 2020; Alvarado, 2017; ILO, 2001).

2.5.2. *Technical Skills*

Technical skills are those skills applied to a technical profession or work required by the selected industries of this study. The duration of technical training is from three months to five years disseminated given by TVET organissations (I&CD, 2021; NAVTTC, 2021; B-TEVTA, 2021; H&TED, 2021; UNESCO-UNEVOC, 2017; ILO, 2001).

2.5.3. *Common Skills*

Common skills are those skills that apply to generic HR and work requirements of the selected industries of this study. These types of jobs are neither vocational nor technical pertaining to skill mapping for a specific industry analysed in this study (UNESCO-UNEVOC, 2017; ILO, 2001).

2.5.4. Specific Skills

The category of specific skills is a subset of the total number of both technical and vocational skills that apply to a practical profession and/or technical jobs required by the industries selected for this study (UNESCO-UNEVOC, 2017; ILO, 2001).

2.6. Estimating TVET Skills and Skill-based Jobs Creation

Skills mapping is calculated for each industry according to the four above-mentioned categories of skills. The number of available jobs is estimated according to the skill needs of the labour force working in an industry. The average number of the required skilled labour force in each skill trade is multiplied by the number of skills required and the total number of industrial units working/functional in an industry, resulting in the estimated available jobs generated by an industry. The number of potential jobs created is estimated as the product of the number of potential industrial units to be installed in SEZs/EPZs, the number of required skills in each category, and the average number of skilled labour required for a specific industry selected for this study.

3. RESULTS AND DISCUSSIONS

3.1. Mapping TVET System of Balochistan

The TVET system of Balochistan consists of provincial and federal TVET departments, authorities, and commissions. TVET skills are supplied through both the public and private sectors' skill development institutes, which are registered, affiliated, and financed by provincial/national TVET departments, authorities, and commissions. The TVET system of Balochistan is mapped following Khan & Ahmed (2019).

3.1.1. *The Structure of Public TVET Organisations*

Mainly, there are four public sector departments, namely Colleges, Higher and Technical Education Department (CHTED), Social Welfare, special education literacy, non-formal education and human rights department (Social Welfare Department or SWD), Labour and Manpower Department (L&MPD), Commerce and Small Industries Department (C&SID), the Women Development Department (WDD), the NAVTTC regional directorate, and one partially functional B-TEVTA for the provision of TVET skills and education both for females and males in the province. It was revealed during this study that two out of the four TVET departments do not have any mechanism for the registration of the private sector TVET institutes to work for the provision of vocational and technical training in the province. However, many NGOs are registered with the SWD and working for vocational training for the vulnerable groups of imprisoned and children to a very selective and limited extent (Ahmed, 2019; FGDs, 2021; Field Surveys, 2021).

3.1.2. *The Structure of Private TVET Organisations*

There are more than three hundred institutions registered with the L&MPD for the promotion of vocational training in the province. However, more than 70 percent of these are non-functional. These institutions are working for a limited conventional training subject to getting funds and/or sponsorship by NGOs and organisations such as NAVTTC, BRSP, Mercy Corp, and UNICEF, to mention a few. These institutions are private and run by NGOs, such as community-based social organisations. They only provide vocational training in basic trades of computer and IT, beautician, tailoring and knitting, cooking, and handicrafts mostly for women. They also offer three-month basic courses in electrical, mechanical, computer and IT, and woodwork for men in rural and urban areas. However, no regular programmes for the mentioned vocational trades are run by these TVET institutions. There has been a discontinuity in the functioning of these institutions and their programmes from the time they were registered till the cancellation of their registration by the affiliate patron department (NSIS, 2019; Field Surveys, 2021; Khan and Ahmed, 2019; BRSP, 2020).

Most of the TVET skills programs are non-regular, cover very limited skills, are very generic in nature, and do not focus upon specific TVET skill requirements of the selected existing, proposed, and potential industries of Balochistan. The estimates of job creation for the unemployed youth of Balochistan as one of the prime objectives are subject to the provision of specific TVET skills, the extension of the scope of TVET skill supply related to individual labour needs, and more investment in TVET institutes for enlarging the overall provincial TVET system in Balochistan (FGD 1-2-3, 2021; Field Survey, 2021).

3.1.3. *Categorisation of Provincial Industries for Skills Mapping*

There are three types of industries identified with the help of the desktop survey, FGDs, and fieldwork conducted by the authors. These are categorised into existing, proposed, and potential industries for this study. The list of existing industries was compiled during the fieldwork and visits to provincial departments, including the I&CD. The lists were also acquired from the official records of the Small Industries Wing of I&CD of the Government of Balochistan (I&CD, 2021). The list of proposed industries was compiled from the official documents of respective SEZs/EPZs via their concerned authorities (P&D, 2021; BoI, 2021; I&CD, 2021). The list of potential industries was identified in FGDs, field visits, informal interviews, members of Chambers of Commerce, LIEDA, GIEDA, and other TVET stakeholders in the province.

3.1.4. *Selection of Industries for Skill Mapping*

The wide scope of the industrial landscape of provincial industrial set-ups for skill mapping constrained us to select a limited number of industries covering all the three industrial categories mentioned above. We have selected one industry from existing, proposed, and potential industries from each of the three SEZs/EPZs, Bostan, Gawadar, and Hub. The parameters such as TVET skill provision, TVET skill demands, job creation prospects, the functionality of the industry, TVET skills relevancy, economic importance, the availability of data, the volume of industrial set-ups, TVET supply and demand, availability of raw materials for these industries, locations of SEZs/EPZs, and many other socio-economic and industrial aspects were taken into consideration during the whole process of this exercise (Table 1; FGDs 1, 2 & 3, 2021; L&MPD; I&CD, 2021; BoI, 2021; GIEDA, 2021; LIEDA, 2021).

Thus, the three specific industries of snuff/tobacco, seafood, and shipbreaking industries are selected from the existing industrial set-ups. The food processing, steel and iron, and marble and mineral industries are taken from the category of proposed industries, and the chromite, small boat making, and fisheries/olive oil extraction industries are selected from the potential industries (FGDs 1, 2 & 3, 2021; L&MPD; I&CD, 2021; BoI, 2021; GIEDA, 2021; LIEDA, 2021; District Profiles Pishin/Lasbela/Gwadar, 2012; Field Visits, 2021; personal communications, 2021, I&CD, 2021; BoI, 2021).

Table 1

Selection of Industries for Skills Mapping

SEZ/EPZ	Existing Industry	Proposed Industry	Potential Industry
Bostan SEZ	Snuff/Tobacco	Food Processing	Chromite
Gwadar EPZ	Seafood	Steel and iron producing Industry	Small Boat Making
Hub SEZ	Shipbreaking	Marble & Mineral Grinding	Fisheries and Olive Oil Extraction

Source: I&CD, 2021; LIEDA, 2021; GIEDA, 2021; District Profiles Pishin/Gawadar/Hub, 2012; FGDs, 2021.

3.2. Tabulations and Discussion on Skills Mapping and Estimates of Jobs Creation

This section has tabulated skills mapping for the selected nine industries of the Bostan, Gawadar, and Hub industries. The estimates of available and potential jobs creation are also tabulated and described in the following way.

3.2.1. *Skills Mapping for Three Selected Existing Industries*

The data shows that total number of TVET skills for getting employment in tobacco industry are 15, including 11 vocational and 4 technical in nature, and total number of common and specific skills needed are 24, including 14 and 10 for common and specific, respectively, to create jobs in 40 units of functional tobacco units in Balochistan. For the Seafood industry of Gawadar, the total number of TVET and common and specific skills are 27 and 50, respectively. Several 14 vocational, 13 technical, 23 common and 27 specific skills are required to create jobs for unemployed youth of Balochistan. Similarly, the vocational skills shipbreaking industry of ZEZ of Hub requires 24, 27, 24, and 51 skills for vocational, technical, common, and specific categories to ensure jobs in 80 existing shipbreaking units currently in shipbreaking industry of the province (Table 2).

Table 2

Total Number of TVET Skills for Three Existing Industries

SEZ/EPZ	Industry	Units	No. Vocational Skills	No. of Technical Skills	Total No. of TVET Skills	No. Common Skills	No. of Specific Skills	Total No. of Common & Specific Skills
Bostan	Tobacco	40	11	4	15	14	10	24
Gawadar	Seafood	10	14	13	27	23	27	50
	Seafood	4	14	13	27	23	27	50
Hub	Shipbreaking	80	24	27	51	24	51	75

Source: I&CD, 2021; District Profile Pishin/Gawadar/Hub, 2012; Field Surveys, 2021; KIIs; FGDs, 2021.

3.2.2. *Skills Mapping for Three Selected Proposed Industries*

The following Table 3 shows that a total of 43 TVET skills are needed in the Food Processing industry proposed for SEZ of Bostan. Similarly, a total of 57 common and specific skills are needed to ensure jobs for unemployed youth of Balochistan in this

Table 3

Total Number of TVET Skills for Three Proposed Industries

SEZ/EPZ	Industry	Units	No. Vocational Skills	No. of Technical Skills	Total No. of TVET Skills	No. of Common Skills	No. of Specific Skills	Total No. of Common & Specific Skills
Bostan	Food Processing	4	15	24	43	31	26	57
Gawadar	Steel/Iron	13	17	35	52	29	34	63
Hub	Marble & Mineral	250	26	35	61	25	37	62

Source: LIDA, 2021; GIEDA, 2021; I&CD, 2021; District Profile Pishin/Gawadar/Hub, 2012; Field Survey, 2021; FGDs, 2021.

industry. Most of the skills are common, followed by specific, vocational, and technical respectively for this industry. The skills for the steel and iron industry are mostly technical and specific for proposed industry on SEZ of Gawadar. The proposed industry of marble and mineral, mostly located in SEZ of Hub, requires 26 vocational skills, 35 technical, 25 common, and 37 specific skills to create jobs for unemployed youth of Balochistan.

3.2.3. *Skills Mapping for Three Selected Proposed Industries*

The skills mapping data of three potential industries elaborates somehow extensive number of skills in SEZs/EPZs of Gawadar and Hub. As both the SEZs/EPZs two rows specific to their respective industries. The Chromite industry is highly technical, and 130 total numbers of skills are required to get jobs in these SEZs/EPZs of Bostan and Hub. However, the EPZs/SEZs of Hub and Gawadar share 57 total skills required for getting jobs in fisheries and olive oil industrial units. The details of all the TVET and common and specific skills for these industries are given below (Table 4).

Table 4

Total Number of TVET Skills for Three Potential Industries

SEZ/EPZ	Industry	Units	No. Vocational Skills	No. of Technical Skills	Total No. of TVET Skills	No. Common Skills	No. of Specific Skills	Total No. of Common & Specific Skills
Bostan	Chromite	7	19	28	47	64	66	130
Gawadar	Small Boat Making	22	15	20	35	23	35	58
	Fisheries/Olive-Oil	5	15	30	45	18	39	57
Hub	Chromite	4	19	28	47	64	66	130
	Fisheries/Olive-Oil	9	15	30	45	18	39	57

Source: Chamber of Commerce Quetta, 2021; GIEDA, 2021, LIEDA, 2021; I&CD, 2021; District Profile Pishin/Gawadar/Hub, 2012; Field Surveys, 2021; FGDs, 2021.

3.2.4. *Estimated Number of Job Creation by the Snuff/Tobacco Industry*

The study assumed that at least two skilled labours are hired to work in a snuff/tobacco factory in Pishin (Field Survey, 2021). There are 24 categories of jobs available in a functional snuff/tobacco factory, out of which 15 jobs are based on TVET skills. Therefore, 15 TVET skilled labour out of 48 (=24x2) total hired labour force are needed for the snuff/tobacco factory to work functionally. The total labour demand side reflects 48 job opportunities in overall employment and 30 job opportunities for TVET skills-based employment in a snuff/tobacco factory in Pishin (Field Survey, 2021). The data of existing industries showed that there are 40 units of snuff/tobacco factories in the province, thus, the total number of jobs created by snuff/tobacco industries was estimated to be 1,920 (=40x48) for youth in Balochistan. The TVET-based jobs created were approximately 1,440 (=30x48) by the 40 snuff/tobacco factories in Balochistan (I&CD, 2021; Field Survey, 2021). Notwithstanding, the potential job creation in the snuff/tobacco industry depends upon the potential number of snuff/tobacco factories to be installed in this industry. The study identified the potential for approximately 1000

snuff/tobacco factories in the province (FGDs 1 & 2; Field Survey, 2021). Thus, the provincial snuff/tobacco industry alone could create approximately 48,000 jobs (=48x1000) including 30,000 (=30x1000) TVET skilled jobs for the unemployed youth of Balochistan (authors' calculations, 2021).

3.2.5. *Estimated Number of Job Creation in the Seafood Industry*

On average one skilled labour was hired to work in a seafood industrial unit in Gwadar and Hub areas of Balochistan. So, for 14 seafood industrial units reportedly functional in the Gwadar and Hub industrial zones of the province (Table 5; Field Survey, 2021; I&CD, 2021; Personal Communication, 2021), the available jobs in a functional unit were 27 and 50 for vocational/technical and common/specific categories, respectively. There are approximately 14 small seafood units in Gwadar and Hub industrial areas. The total number of jobs generated by 14 seafood enterprises was estimated to be 700 (= 14x50) for all the TVET skills. Similarly, the TVET skill-based jobs of 378 (= 14x27) were available for seafood-related skills holders in the 14 seafood industrial units in the province. More jobs can be created if this very local seafood industry is prioritised in terms of TVET skill policy formulation and its implementations to create jobs for the unskilled youth of the 600 km coastal area of Balochistan (FGD 1,2 &3, 2021; Field Survey, 2021; I&CD, 2021). Potential job creation depends upon the potential of seafood production along the 600 km long coastal areas of Balochistan. This long coastal area, full of seafood products and species can be used for the establishment of potential seafood industry in SEZs/EPZs of Balochistan. The study's results indicate that approximately more than 200 seafood enterprises may create jobs for approximately 10,000 (=50x200), out of which 5,400 (=27x200) are TVET skill-based jobs.

3.2.6. *Estimated Job Creation in the Shipbreaking Industry*

Similarly, three to four skilled labours are necessary to work in a functional shipbreaking unit located in Gadani near Hub areas of Balochistan. The data show that there were around 80 ships scrapped from 2018 to 2020 in the Gadani coastal area of Balochistan (FGDs 2 & 3, 2021; Personal Communication, 2021; Field Survey, 2021). The estimates of available jobs in a shipbreaking unit were 51 and 75 in vocational/technical and common/specific skills categories, respectively. Since approximately 80 ships were broken and scrapped, the average employment created in 2020 by a single shipbreaking industry was 240 (=80x3) in Balochistan (Field Survey, 2021). The total number of jobs created by scrapping 80 ships in 2020 was around 18,000 (= 240x75), including 12,240 (= 240x51) TVET-based jobs with skills relevant to the shipbreaking industry. Most of the jobs required both technical and vocational skills. The potential job creation in the shipbreaking industry depends upon the implementation of safety rules for labours, promoting the shipbreaking industry, and providing relevant TVET skills. The study estimated that there is a potential of scrapping and breaking 150 ships per year in Balochistan (FGDs 1 & 2; Field Survey, 2021). Thus, the provincial shipbreaking industry could create 33,750 (=3x75x150) jobs, including 22,950 (=3x51x150) TVET-based jobs, based on average job creation of 225 (=3x75) when a ship is scrapped and broken (authors' calculations, 2021; (FGDs 1, 2, & 3; 2021; Field Survey, 2021; Lasbela Chamber of Commerce, 2021).

Table 5

Estimates of Jobs Creation by Three Selected Proposed Industries

SEZ/EPZ	Industry	Total Skills	TVET Skills	Available Jobs/ Skill	Units		Available Jobs		Potential Jobs Creation	
					Existing	Potential	Total Jobs	TVET Jobs	Total Jobs	TVET Jobs
Bostan	Food Processing	57	43	1	4	1000	228	172	57000	43000
Gawadar Hub	Steel/Iron	63	52	4	13	120	3276	2704	30240	24960
	Marble & Mineral	62	61	3	250	1500	46000	45750	279000	274500

Source: Chamber of Commerce Quetta, 2021; GIEDA, 2021, LIEDA, 2021; I&CD, 2021; District Profile Pishin/Gawadar/Hub, 2012; Field Surveys, 2021; FGDs, 2021.

3.2.7. *Estimated Job Creation in the Food Processing Industry*

There were 4 food processing units working mostly located in the Quetta industrial zones of the province (Tables 5; Field Survey, 2021; I&CD, 2021; Personal Communication, 2021). The available jobs in a functional food processing industry were 43 (=43x1) and 57 (=57x1), on average of one job per skills, in vocational/technical and common/specific categories. The total number of jobs created by 4 food processing units was estimated at around 172 (= 4x43) for the TVET-skilled labour force and 228 (=57x4) for the overall skilled and unskilled labour force of the province (Field Survey, 2021). However, more jobs can be created if the food processing industry techniques via TVET training are taught in TVET institutes (FGD 1 & 2, 2021; Field Survey, 2021; I&CD, 2021). Thus, the provincial food processing industry could create potential jobs for approximately 57,000 workers (=57x1000), including 43,000 (=43x1000) TVET-based jobs. However, the job creation potential of this sector depends upon many factors including the provision of relevant TVET skills required by the food processing industry (FGDs 1 & 2; Field Survey, 2021; authors' calculations, 2021).

3.2.8. *Estimated Number of Job Creation in the Steel Industry*

The study's estimates suggest that, on average, four to five skilled labours are hired to work in a functional steel production unit. There are a total of 13 steel production units and that has created a total of 208 (=52x4) jobs for vocational/technical skilled labour force and 252 (=63x4) jobs for common/specific categories of skills qualifications. The total number of employment opportunities created by 13 steel/iron producing mills/units was estimated to be around 2,707 (= 13x208) for vocational/technical skilled labour force and 3,276 (=13x252) for common/specific categories of skills requirements. The statistics and field survey observations show that most of the jobs were highly advanced in vocational or technical terms of job responsibilities for the steel/iron mills workers. The potential job creation in the steel/iron industry depends upon the potential number of steel mills to be installed in SEZs/EPZs of Balochistan. The study estimates that there is a potential of approximately 120 steel/iron producing units/mills (FGDs 1, 2 & 3; 2021; Field Survey, 2021). Thus, the provincial steel and iron producing industry can potentially create30,240 (=120x4x63) jobs for the skilled and unskilled labour force and 24,960 (=120x4x52) skilled labour force, based on average job creation of 845 by a functional steel/iron mill. However, the job creation potential of this sector depends upon

many factors including the provision of relevant TVET skills demanded by the steel and iron producing industry (authors' calculations, 2021; FGDs 1 & 3, 2021; Field Survey, 2021; I&CD, 2021).

3.2.9. *Estimated Number of Job Creation in the Marble/Grinding Industry*

The estimates of available jobs in a functional marble/mine grinding factory were 61 and 62 vocational/technical workers and common/specific workers, respectively (Table 5). Since there are approximately 250 marble/mine grinding factories in areas near SEZs of Bostan and Hub, the average employment created by a functional marble/mine grinding factory for the skilled labour force was estimated to be 181 (=3x61), on average 3 jobs/skill, for the skilled category and 186 (3x62) for both the skilled and unskilled workers categories in Quetta and Hub industrial zones (Field Survey, 2021). The total number of available jobs or employment opportunities created by 250 marble/mine grinding units was estimated to be around 45,750 (= 250x181) for TVET skill holders and the estimated number of jobs for all the skilled and unskilled workers in the industry was estimated to be 46,500 (= 250x186). The estimates of potential job creation in the marble/mineral grinding industry depend upon the potential number of marble/mine grinding factories to be installed in SEZs/EPZs of Balochistan. According to the study's estimation, approximately 1,500 marble/mine grinding factories can be set up based on the estimates of 300 billion tons of marble reserves in Balochistan and KPK and the export share of 90 percent in overall exports of marble from Balochistan to almost 52 countries worldwide (FGDs 1 2 & 3, 2021; Field Survey, 2021; Keerio & Abden, 2017; Malkani & Mahmood, 2017; Mohammad, 2016). Thus, the provincial marble/mineral grinding industry could create approximately 274,500 (=181x1500) and 279,000 (=186x1500) jobs for the required TVET skill holders and overall labour force, respectively for unemployed youth of Balochistan. However, the job creation potential of this sector depends upon many factors including the provision of relevant TVET skills relevant to the skills demanded in the marble/mineral grinding industry (authors' calculations, 2021).

Table 6

Estimates of Jobs Creation by Three Selected Existing Industries

					Units		Available Jobs		Potential Jobs Creation	
SEZ/EPZ	Industry	Total Skills	TVET Skills	Available Jobs/Skill	Existing	Potential	Total Jobs	TVET Jobs	Total Jobs	TVET Jobs
Bostan	Tobacco	24	15	2	40	1000	1920	1440	48000	30000
Gawadar	Seafood	50	27	1	14	200	700	378	10000	5400
Hub	Shipbreaking	75	51	3	80	150	18000	12240	33750	22950

Source: Chamber of Commerce Quetta, 2021; GIEDA, 2021, LIEDA, 2021; I&CD, 2021; District Profile Pishin/Gawadar/Hub, 2012; Field Surveys, 2021; FGDs, 2021.

3.2.10. *Estimated Number of Job Creation in the Chromite Industry*

The study's estimates show that, on average, two to three skilled labours were hired to work in a functional chromite processing unit located in the Muslimbagh and Wadh (Khuzdar) areas of Balochistan. There are a total of 11 chromite processing units working in areas near the SEZs in Bostan and Hub (Table, 7; Field Survey, 2021; I&CD,

2021; Personal Communication, 2021). The estimates of available jobs in functional chromite processing units were 47 and 130 in vocational/technical and common/specific categories of skills trades requirements, respectively. So, 11 chromite processing units in Hub and Bostan industrial areas may create 33 (=11x3) jobs in both Bostan and Hub (Field Survey, 2021). The total number of available jobs in 11 chromite processing units was estimated to be 1,551 (=11x3x47) for vocational/technical skill holders and 4,290 (=11x3x130) for the common/specific skilled labour force. The statistics and field survey observations show that most of the jobs were highly advanced in vocational or technical terms in the chromite processing industry. The results of the study show that approximately 100 to 120 chromite processing units can be established in the region (FGDs 1 & 3, 2021; Field Survey, 2021). Thus, the provincial chromite industry can potentially create approximately 14,100 jobs (=100x3x47) in the technical/vocational category and 130,300 (=100x3x130) jobs in the common/specific category for unemployed youth of Balochistan. However, the job creation potential of this sector depends upon factors such as the provision of relevant TVET skills to the provincial labour force of Balochistan that is demanded by the chromite processing industry (FGD 1 & 3, 2021; Field Survey, 2021; I&CD, 2021; Authors' Calculations, 2021).

3.2.11. *Estimated Number of Job Creation in the Boat-making Industry*

There was a total of 22 boat-making manufacturing units in Gwadar and Hub areas estimated during the fieldwork of this study (Table, 7; Field Survey, 2021; GIEDA, 2021; Personal Communication, 2021). The estimates of available jobs in a functional boat-making unit were 35 and 58 in vocational/technical and common/specific skill categories, respectively. So, for 22 small boat-making units, the average employment created is estimated to be around 70 (=35x2) and 116 (=58x2) for vocational/technical and common/specific TVET skilled labour force, respectively (Field Survey, 2021). Plus, an approximate number of total employment created by these units was around 1,540 (=22x35) in the vocational/technical category and 2,552 (=22x116) in the common/specific TVET skills category. Potential job creation in the small boat-making industry depends upon the potential number of boat manufacturing units to be installed in SEZs/EPZs of Balochistan. The estimations show that approximately 100 small boat-making manufacturing units can be established (FGDs 1 2 & 3, 2021; Field Survey, 2021). Thus, the small boat-making industry could create jobs for approximately 7,000 (=70x100) and 11,600 (=116x100) for the vocational/technical and common/specific TVET skilled labour force, respectively. However, the job creation potential of this sector depends upon many factors including the provision of relevant TVET skills pertaining to the skill demands of small boat-making and relevant trades of this industry to create employment opportunities for the provincial labour force of Balochistan (FGD 1, 2 & 3, 2021; Field Survey, 2021; I&CD, 2021; Authors' Calculations, 2021).

3.2.12. *Estimated Number of Job Creation in Fisheries/Olive-Oil Extraction Industry*

The estimates of available jobs in a functional fisheries/olive oil extraction unit were 90 (=45x2) and 114 (=57x2), based on 2 average job/skill available, for vocational/technical and common/specific skill categories, respectively, for a functional fishery and/or olive oil extraction unit in Gwadar, Winder, and Hub areas

of Balochistan. There were total of 14 (5+9) fisheries/olive oil extraction units working in areas near the SEZs of Gwadar and Hub (Table, 7; Field Survey, 2021; I&CD, 2021; Fisheries Department, 2021; Agriculture Department, 2021; Personal Communication, 2021). The total number of employment opportunities and available jobs respectively for vocational/technical and common/specific categories of the skilled labour force was 1,260 (=90x14) and 1,596 (114x14), created by 14 fisheries/olive-oil extraction units in the province (authors' calculation, 2021). The field survey observations and FGDs showed that most of the jobs were advanced in vocational, technical, and specific skills. The estimates of potential job creation in the fisheries/olive oil extraction industry depend upon the potential number of fisheries/olive oil extraction units to be installed around the sea areas and olive oil extraction fields. The results of the study show approximately 150 fisheries units and 100 olive oil extraction units (FGDs 1 & 2; Field Survey, 2021). Thus, the estimates of potential job creation by the fisheries and olive oil extraction industry were 13,500 (90x150) and 17,100 (114x150) for skilled labour (Authors' Calculations, 2021; C&SID, 2021; GIEDA, 2021).

Table 7

Estimates of Jobs Creation by Three Selected Potential Industries

				Available	Units		Available Jobs		Potential Jobs Creation	
SEZ/EPZ	Industry	Total Skills	TVET Skills	Jobs/ Skill	Existing	Potential	Total Jobs	TVET Jobs	Total Jobs	TVET Jobs
Bostan	Chromite	130	47	3	11	100	4290	1551	130300	14100
Gawadar	Small boat Making	58	35	2	22	100	2552	1540	11600	7000
Hub	Fisheries Olive-oil	57	45	2	14	150	1596	1260	17100	13500

Source: Chamber of Commerce Quetta, 2021; GIEDA, 2021, LIEDA, 2021; I&CD, 2021; District Profile Pishin/Gawadar/Hub, 2012; Field Surveys, 2021; FGDs, 2021.

4. CONCLUSION AND POLICY RECOMMENDATIONS

4.1. Conclusion

The study mapped TVET skills for the categories of vocational, technical, common, and specific skills for the selected nine industries from among the categories of existing, proposed, and potential industrial set-ups to be established in the three SEZs/EPZs of Bostan, Hub and Gwadar in Balochistan. Four types of TVET skills are listed in numbers for each of the nine selected industries for this study. The study has also mapped the TVET institutional framework to show supply TVET side for the youth of Balochistan, in general, but not specific to meet the labour market needs of the selected nine industries in SEZs/EPZs of Balochistan. The study also estimated the available and potential numbers of jobs creation for employment opportunities created by these selected industries. The under-developed and vague picture TVET skill mapping for industrial development may likely put forth its case for the following policy implications.

4.2. Expected Policy Implications

The following policy implications may likely guide the policy process for effective skills development to ensure job creation for the unemployed youth of Balochistan.

(1) A well-coordinated and comprehensive TVET framework should be devised to include all the supply-side and demand-driven aspects of skill formation for industrial development in SEZs/EPZs of Balochistan.
(2) There is a strong need for coordination and alignment of B-TEVTA with allied provincial TVET departments that should work collectively to reduce the existing skill deficiencies of the provincial labour force.
(3) The recognition and functionality of B-TEVTA as per the B-TEVTA Act of 2011 should be mandated for regulation, execution, and skill development in the province.
(4) The linkages between TVET institutes and industries are strongly recommended to fill the skill gaps to ensure employable opportunities for the provincial labour force.
(5) The study finally recommends human resource planning based on TVET skills required by the industries of SEZs/EPZs to ensure job creation, decent work, and livelihood for the unemployed youth in the industrial setups of SEZs/EPZs of Balochistan.

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A Techno-Economic Analysis of Widespread Microgrid/Minigrid Deployment in Pakistan's Electrical Power Sector

DANIAL SALEEM and SALIS USMAN

In the recent past, the Government of Pakistan has undertaken certain appreciable initiatives in the electrical power sector, which is undergoing an extensive reform and restructuring process, particularly in the areas of decarbonisation and deregulation. Although Pakistan is blessed with abundant natural energy resources, a significant percentage of the population remains without electricity access since the expansion of the centralised grid is uneconomical due to certain reasons, including but not limited to limited financial resources and a scattered population. In this regard, micro/mini-grid (MG) deployment offers an excellent opportunity to address this problem, improve the life quality of the people of Pakistan, and help improve the economy. The study is predominately based on simulation and analysis-based research methods wherein the techno-economic analysis is performed keeping in view the technical and commercial aspects and also MG impacts on Pakistan's power grid and prospective customers of MGs.

According to this study's findings, in comparison to fossil fuel-based MGs, renewable energy-dominated MGs offer a lucrative investment opportunity/financial viability and also contribute to reducing adverse effects on the environment. Even though MGs present a cost-effective solution for the remote unelectrified areas of Pakistan, they may suffer from technical issues if not properly designed. Direct current MGs and the application of MGs for irrigation purposes present interesting cases with respect to reducing the overall cost of energy. Some of the important factors to be considered to evaluate the feasibility of MGs are the electricity demand pattern, supply reliability requirement, discount rate, and project lifetime, among other things.

There is an urgent need for a comprehensive policy and regulatory framework since the existing one is insufficient to effectively upscale MGs deployment in Pakistan. While assessing electricity provision options for remote unelectrified areas of Pakistan, the electricity planners must consider and evaluate MGs before proposing huge investments in transmission and distribution infrastructure. One of the important considerations is to align the design of MGs with the affordability for the customers in each specific geographical area, to create a win-win situation for all the stakeholders.

1. INTRODUCTION

In pursuit of energy access and low-cost sustainable energy, there is a need to move away from the integrated grid due to its inefficient and unsustainable nature, which results in a high cost of electricity to the consumers. In this regard, the CTBCM is the beginning of the decentralisation of the power sector in Pakistan. However,

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microgrids/mini-grids (MGs) fit into the jigsaw of the decentralised power sector as they can provide sustainable and low-cost energy to the consumers of electricity promising more value for money. MGs are gradually taking the center stage in the future outlook of the power sector both in Pakistan and globally.

1.1. Rationale for Mg Development

MG is a small network of electricity generators and storage that use local energy resources (mostly renewables or hybrid) to generate electricity that can function independently as well as in connection with the grid. Globally, the size of MGs ranges from 1 kW to 10 MW.

A significant area of Pakistan is yet to be electrified even though the country is bestowed with huge natural energy resources geographically spread throughout the land. Due to various reasons, such as limited financial resources and scattered population/electricity demand (particularly in Balochistan), the expansion of the national/DISCO grid to most of the unelectrified locations is not economically viable. Therefore, MGs have a huge potential to improve the quality of life quality of the people of Pakistan and complement the economy. Fortunately, unstructured efforts have already started in the country. Globally, MGs have become a mainstream solution for providing energy access to everyone. It is, therefore, inevitable to upscale the setting up of MGs wherever required and, of course, potentially possible. Following are some of the important factors that necessitate the upscaling of MGs for providing energy access at a low cost to the people of Pakistan:

(1) Sharp and sustained increasing trend of end-consumer tariff.
(2) A large number of unelectrified areas in Pakistan are not expected to be electrified soon.
(3) Decreasing cost trend of MGs deployment due to significant reduction in the individual component costs of MGs, such as converters, solar PV panels, wind turbines, etc.
(4) The availability of huge potential for renewable energy resources, such as solar, wind, hydro, etc.
(5) A substantial number of areas in Pakistan have difficult terrain making grid access difficult.
(6) Detrimental environmental impacts being faced by Pakistan in recent years due to a significant share of conventional fuels in electricity generation and the usage of other inefficient fuels due to a lack of generation adequacy.
(7) Hampering economic development due to lack of electricity access in remote areas.
(8) Prevailing supply unreliability to remote areas.

The Government of Pakistan (GOP) promulgated the National Electricity Policy in 2021 which stresses the sustainability of the electrical power sector in Pakistan. It means that the GOP has decided to pass electricity prices in full to end-consumers by withdrawing subsidies, contrary to other developing nations of the world. The policy direction for sustainability in Pakistan's electricity sector will have considerable implications for the people of Pakistan who are already paying a very high per unit tariff for electricity.

Considering the internal report of one of the credible institutions of Pakistan's power sector (it is an internal working report and is expected to be publicised soon), the existing average tariff, i.e., Rs 14.85/kWh is forecasted to be Rs 24.28/kWh in the year 2030 excluding taxes. This forecast is based on certain optimistic assumptions of factors listed below. Any variation in these factors may significantly increase the forecasted end-user tariff.

(1) A rising trend of inefficiencies in the integrated electrical grid.
(2) A continuing trend of incurring the sunk cost of committed power projects.
(3) Introduction of the CTBCM and a high probability of an increase in end-user tariff due to market power, inexperience, and increase in stranded costs, etc.
(4) Sharp currency devaluation.
(5) Increase in fuel prices.

Considering the above-mentioned factors and the GOP's target of sustainability in the electricity sector, the people of Pakistan, who can afford the substantial investment, have already started opting for stand-alone roof-top solar PV with and without net-metering provision. A major drawback of stand-alone PV is the unavailability of solar power during the late evening/night time as well as the supply during rain or bad weather. MGs, thus, provide a more complete solution for the issues of higher costs and supply reliability.

Off-grid MG deployment for remote rural areas is a globally accepted solution. The feasibility of MG deployment for various scenarios is analysed in detail in this study. However, it is important to mention here that there are certain challenges in MG design, development, and implementation that need to be addressed for the successful implementation of MG in Pakistan.

After the 18th amendment to the Constitution of Pakistan, the provincial governments can take decisions regarding the generation, transmission, and distribution of electricity in their respective territories. Instead of following a strenuous and long process, which includes project approval at a centralised level and building extensive generation, transmission, and distribution infrastructure, MG deployment is a sustainable solution for the provincial governments in Pakistan.

The far-flung areas of Pakistan are without electricity for approximately 16 hours a day due to multiple reasons, including theft and distribution system unreliability. The reliability of supply through MGs development is another important aspect that is explored in this study.

It is important to mention here that this study does not recommend the deployment of MGs everywhere in Pakistan; rather it highlights certain favourable factors, scenarios, and applications where the MG deployment stands far more promising as compared to other potential options. A few of the possible scenarios are:

(1) Remote rural areas.
(2) Difficult terrain areas where grid access is difficult.
(3) Communities having rich mini/micro hydro potential.
(4) Areas having flexible load demand profiles (or can be easily adjusted).
(5) Hospitals and military installations, which cannot afford unreliable supply.
(6) Housing societies/commercial centres having net metering provision.

(7) Communities/areas where provincial/territorial governments want a viable alternative for the provision of electricity other than the nationally integrated grid.

Since the study has been mandated to analyse unconventional solutions for electricity-related issues in Pakistan, it required simulation-based techno-economic evaluation. Techno-economic evaluation is the key to finding the most feasible solution to electrical energy-related issues. For this purpose, HOMER (Hybrid Optimisation of Multiple Energy Resources) Pro software has been used to present reliable results and findings. The study benchmarked and standardised the analysis procedures to evaluate MG deployment.

One of the key motives to perform this analysis is to present the case for the democratisation of the power sector in Pakistan. Every citizen of Pakistan has the right to receive electrical energy from the seller or opt for electrical energy-related services of his choice, i.e., a utility, service provider, independent MG system, own means, etc. The study explored initiatives to start the journey, as a nation, towards the democratisation of the power sector. It may be highlighted that the recent decision to incentivise ordinary customers by allowing net metering of up to 25 kW without any formal license is an initial step towards the democratisation of the power sector in Pakistan. One of the benefits of providing consumers with a choice for opting for MG solution will be the promotion of competition in the electricity market in Pakistan.

1.2. Research Questions

The following research questions are derived for this study:

(1) Can MG be a possible solution to resolve the issues of unelectrified areas and expensive electricity rates? What are the possible application scenarios for MG development in Pakistan?
(2) How to evaluate the feasibility of MG development in a particular area in Pakistan? What are the general technicalities involved in MG development in Pakistan?
(3) What are the possible advantages/disadvantages of MGs in the context of Pakistan's electrical power sector? How can the policy and regulatory framework be utilised for the successful widespread deployment of MGs in Pakistan?
(4) What are the possible business models, in broader terms, for MGs deployment in Pakistan? What are the recommendations to decision-makers to promote MGs in Pakistan?

1.3. Objectives of the Study

The objective of the study is to present a comprehensive analysis of the widespread deployment of MG systems in Pakistan. The study has been carried out keeping in view the techno-economic and policy perspectives; its results will facilitate the policy makers in taking necessary initiatives for MGs development in Pakistan.

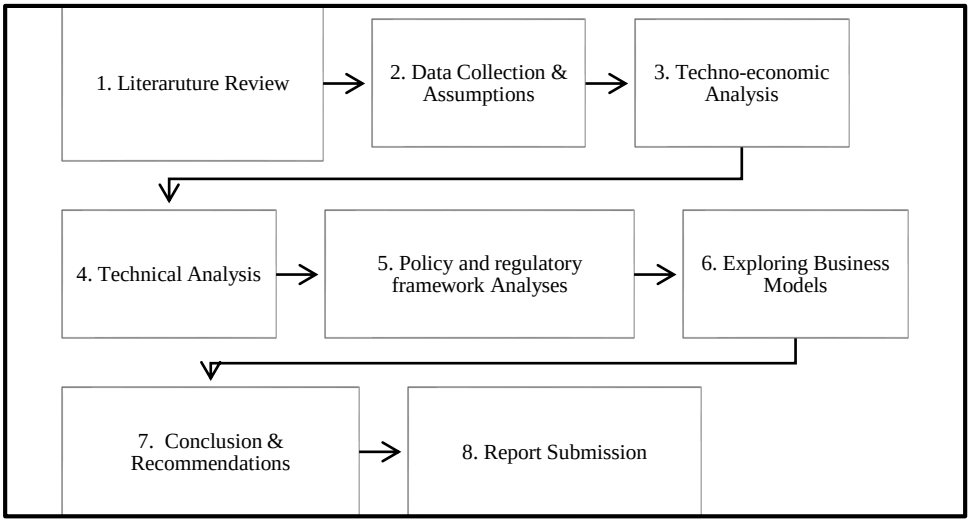
The power sector of Pakistan is already following the path of major restructuring in line with the globally well-established 3D reforms, i.e., decarbonise, decentralise, and

democratise. The current reforms related to 'decarbonise' and 'decentralise' include the important steps of the electric vehicle policy, the implementation of the CTBCM, and the Alternative and Renewable Energy (ARE) Policy 2019. This research work will pave the way for the very next step, which is the 'democratisation' of the power sector through the deployment of MGs in the electrical power network of Pakistan.

1.4. Methodology

The flowchart shown in Figure 1 describes in totality the research methodology followed during the study.

Fig. 1. Research Methodology for the Study



2. MODELLING ANALYSIS, SIMULATION, AND RESULTS

2.1. Techno-economic Analysis

Out of various possible options for widespread MGs deployment in Pakistan, the following three most probable and feasible scenarios have been designed for the pre-feasibility analysis:

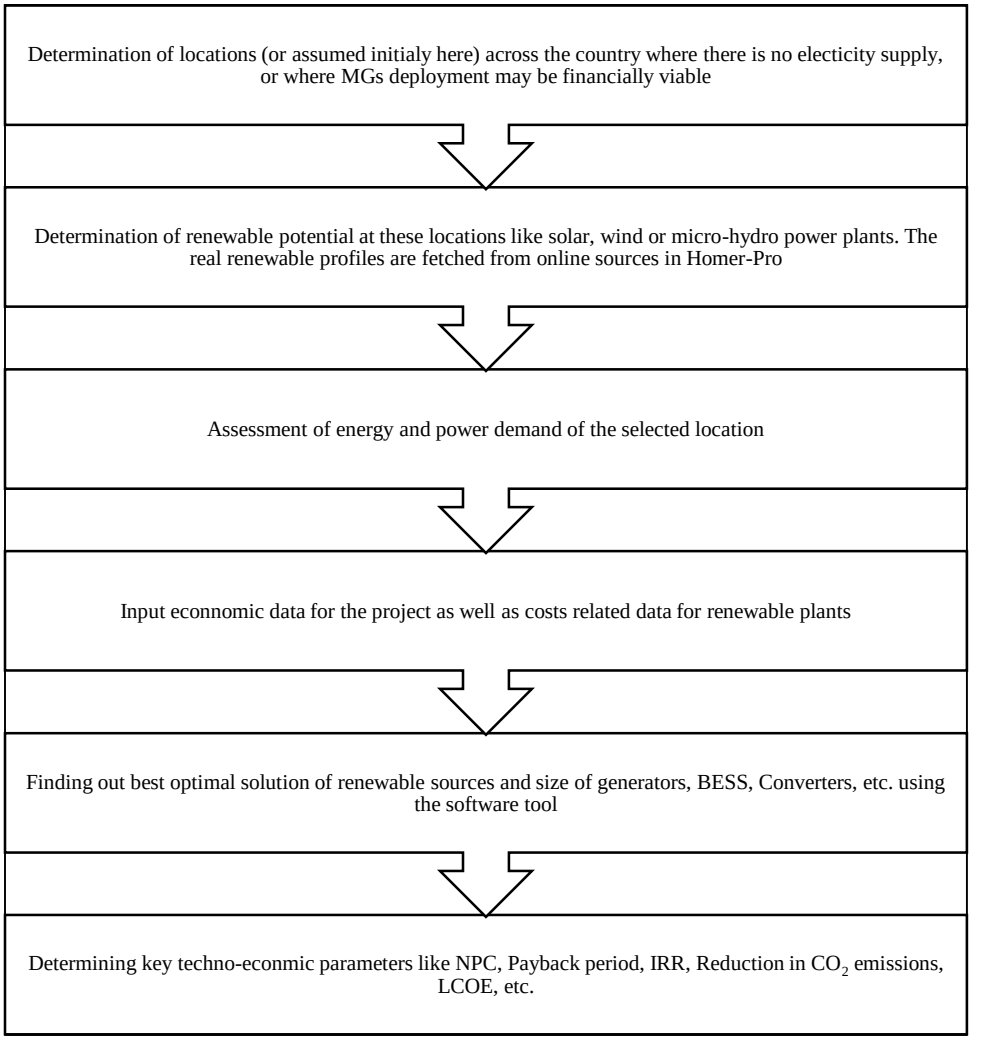
(1) Off-grid MGs application for rural villages/areas having solar PV and wind potential.
(2) Off-grid MGs application for rural villages/areas having solar PV and micro-hydro potential.
(3) Grid-connected MGs application for housing societies or commercial centres in urban areas having utility electricity access.

Each scenario is discussed in the following section along with results/findings. Here we are not going into details of mentioning the basic assumptions used for the study. It is important to mention here that considerations like the cost of distribution infrastructure, cost of land, profit margins, etc. have not been considered for this study,

which need to be taken care of while evaluating the feasibility of a particular project, as it may vary significantly from one case to another.The following approach has been adopted for the techno-economic analysis:

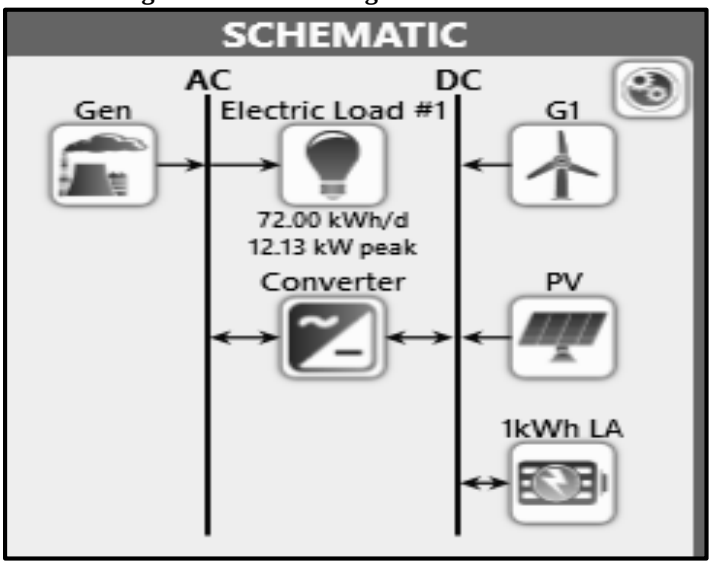
2.1.1. *Scenario 1. Off-Grid MGs Application for Rural Villages/Areas Having Solar PV and Wind Potential*

This scenario is particularly important to analyse the feasibility for remote rural populations having a significant distance from the utility grid connection. This situation is quite relevant in the scenario for Baluchistan, where many areas are still unelectrified and providing grid access to those areas is difficult and does not hold financial viability. A village near Panjgur with geographical coordinates of 26°58.2'N, 64°5.3'E has been considered. A load profile with a peak load of 12.13 kW and annual average energy of 72 kWh/day is considered.



In order to meet this demand profile of electricity, the schematic as shown in Figure 3 has been modelled in the software with the option to optimise the selection and size of the most feasible option considering the real solar and wind profiles from the NASA database.

Fig. 3. Schematic Diagram for Scenario 1



Different technology options (Various Combinations of PV, Wind, Storage and Diesel Generator) have been considered to determine the most feasible one for MG. From twelve different combinations, option with PV + Wind + Storage has been determined to be the most feasible one. It is important to mention here that we are not going into details of mentioning the optimised size/rating for each component along with their Net costs, as well as technical results related to load, storage, and generation from various resources.From the above different combinations, option with PV + Wind + Storage has been determined to be the most feasible one. The optimised size/rating for each component along with their Net costs, as well as technical results related to load, storage, and generation from various resources Comparing the base system (option 1) with the proposed optimised system, the IRR of the proposed system is found to be 79.5 percent, while discounted payback periods and simple payback periods are found to be 1.34 years and 1.32 years, respectively. A brief comparison of the base system and the proposed system is given in Table 1.

Table 1

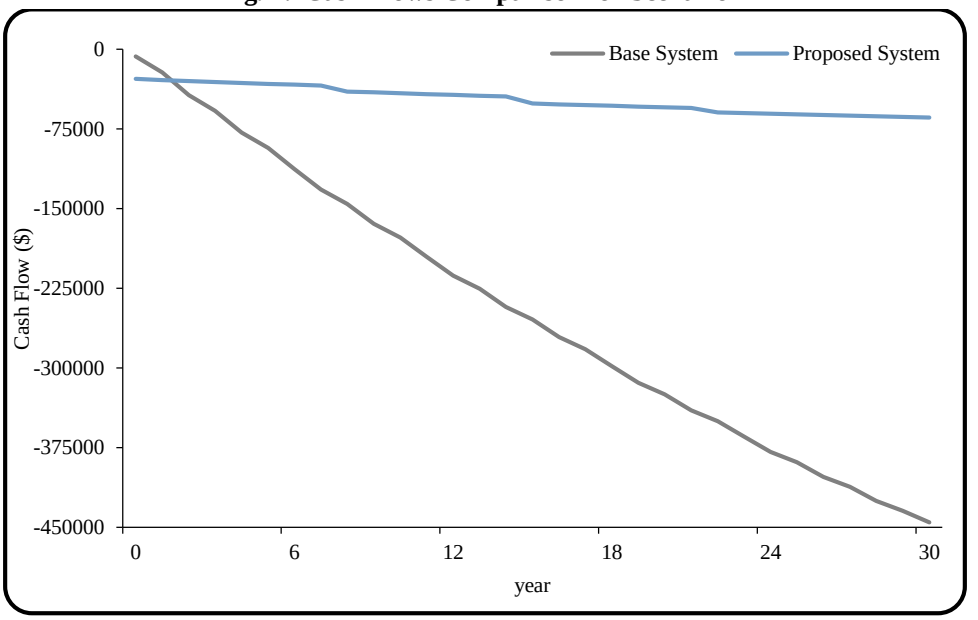
Comparison with Diesel Generator Option for Scenario 1

Parameter	Base System	Proposed System
Net Present Cost	$445,342	$64,120
CAPEX	$6,500	$27,836
OPEX	$19,197	$1,587
LCOE (per kWh)	$0.741	$0.111
CO_2 Emitted (Kg/Year)	39,831	0
Fuel Consumption (Litre/Year)	15,216	0

The Levelised Cost of energy (LCOE) came out to be $0.111/kWh, which is quite reasonable.

A graphical comparison of the base and the proposed system in terms of cash flows for the project lifetime is shown in Figure 4.

Fig. 4. Cash Flows Comparison for Scenario 1



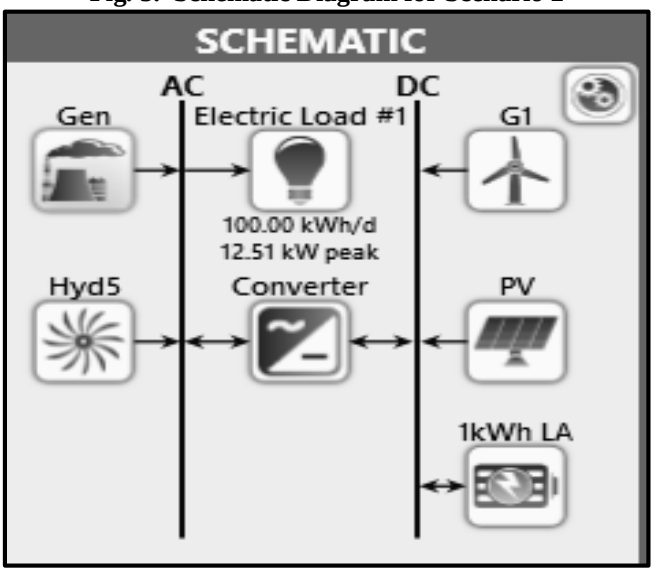
2.1.2. *Scenario 2: Off-Grid MGs Application for Rural Villages/ Areas Having Solar PV and Micro-Hydro Potential*

This scenario is particularly important to analyse the feasibility for remote rural populations having a significant distance from the utility grid connection. This situation is especially relevant for Gilgit Baltistan, AJK, and the northern areas of KPK where a large number of areas are unelectrified and providing grid access to those areas is difficult and is not financially viable. These areas possess large hydropower potential and lack of reliable electricity access especially for clean heating in these areas is a problem. Moreover, burning wood to meet the heating demand in these areas not only affects the environment but also affects the GoP target of promoting tourism in these areas. Hence, off-grid MGs deployment in these areas is a feasible option. The sample feasibility of off-grid MG deployment is discussed in the following section.

A village near Chitral, named Kiyar has been considered with geographical coordinates of 36°5.9’N, 71°51.0’E. A load profile with a peak load of 12.51 kW and annual average energy of 100 kWh/day is considered.

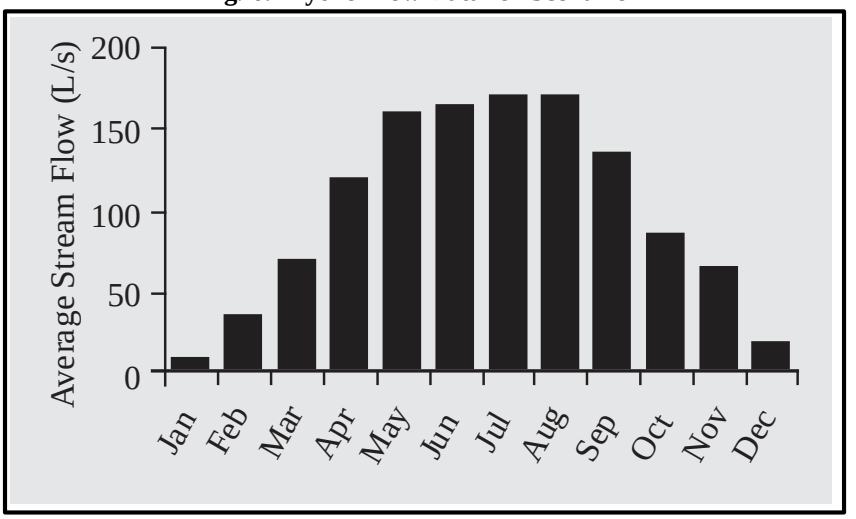
In order to meet this demand profile of electricity, the schematic as shown in Figure 5 has been modelled in the software with the option to optimise the selection and size of the most feasible option considering the real solar and wind profiles from the NASA database.

Fig. 5. Schematic Diagram for Scenario 2



The stream flows assumed for the micro-hydro plant are shown in Figure 6. Available head of 7 m and pipe head loss of 10 percent are also assumed.

Fig. 6. Hydro Flow Data for Scenario 2



Different technology options (Various Combinations of PV, Wind, Storage, Micro-Hydro and Diesel Generator) have been considered to determine the most feasible one for MG. From twenty-six different combinations, option with PV + Storage + Micro-Hydro has been determined to be the most feasible one. It is important to mention here that we are not going into details of mentioning the optimised size/rating for each component along with their Net costs, as well as technical results related to load, storage, and generation from various resources.

It is important to mention here that although per unit cost for micro-hydro is far less than PV and wind sources, the software guided us to choose only 5kW (39 percent) from the hydro source. This is because the hydro flow is almost negligible during winter months, therefore, other sources, such as solar PV, would be needed to meet the load demand ensuring supply reliability to the consumers.

Now, comparing Base System (option 1) with the proposed optimised system, the IRR of the proposed system came out to be 66.1 percent, while discounted payback period and simple payback periods are found to be 1.57 years and 1.53 years, respectively. A brief comparison of the base system and the proposed system is given in Table 2.

Table 2

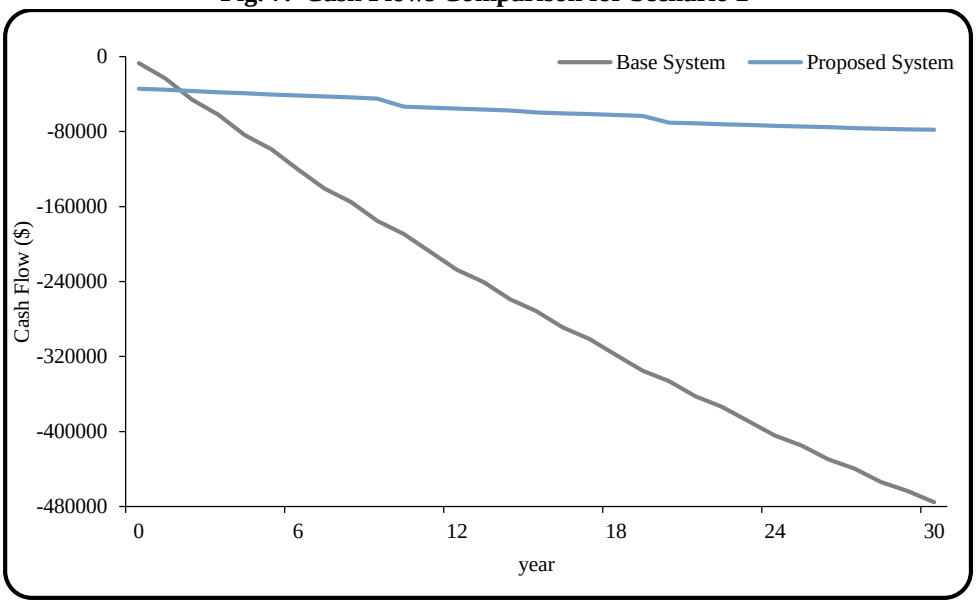
Comparison with Diesel Generator Option for Scenario 2

Component	Base System	Proposed System
Net Present Cost	$475,276	$78,068
CAPEX	$7,000	$34,213
OPEX	$20,485	$1,918
LCOE (per kWh)	$0.570	$0.0981
CO_2 Emitted (Kg/Year)	42,276	0
Fuel Consumption (Liter/Year)	16,151	0

The Levelised Cost of energy (LCOE) turned out to be $0.0981/kWh**,** which is quite reasonable.

A graphical comparison of the Base and the proposed system in terms of cash flows for the project's lifetime is shown in Figure 7.

Fig. 7. Cash Flows Comparison for Scenario 2



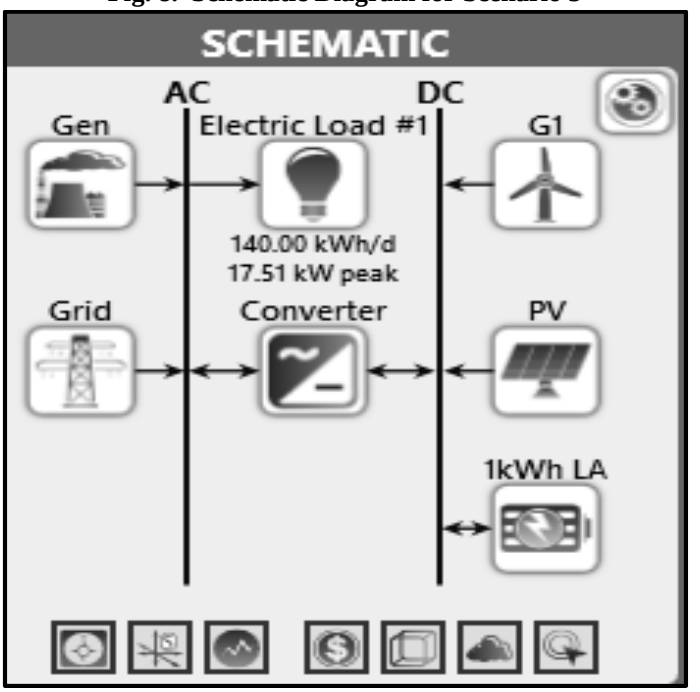
2.1.3. *Scenario 3: Grid-Connected MGs Application for Housing Societies or Commercial Centres in Urban Areas having Utility Electricity Access*

This scenario is particularly important to analyse the feasibility of housing societies or commercial centres situated in urban areas having utility electricity connections. This situation is relevant for large cities in Punjab, KPK, and Sindh, where a lot of private housing societies and large commercial centres already exist or will be developed in the near future. The rationale for considering this MG feasibility here is its ability to create a win-win situation for both the government as well as the private sector.

A small housing society in Lahore near Sunder Raiwind has been considered with geographical coordinates of 31°14.7'N, 74°12.8'E. A load profile with a peak load of 17.51 kW and annual average energy of 140 kWh/day is considered.

In order to meet this demand profile of electricity, the schematic as shown in Figure 8 has been modelled in the software with the option to optimise the selection and size of the most feasible option considering the real solar and wind profiles from the NASA database.

Fig. 8. Schematic Diagram for Scenario 3



Different technology options (Various Combinations of PV, Wind, Storage, Grid and Diesel Generator) have been considered to determine the most feasible one for MG. From twenty-six different combinations, option with PV + Grid has been determined to be the most feasible one. It is important to mention here that we are not going into details of mentioning the optimised size/rating for each component along with their Net costs, as well as technical results related to load, storage, and generation from various resources.

Now, comparing the Base System (option 1) with the proposed optimised system, the IRR of the proposed system turned out to be 20 percent, while discounted payback period and simple payback period are found to be 5.22 years and 4.93 years, respectively. A brief comparison of the Base System and the proposed system is given in Table 3.

Table 3

NPC for Scenario

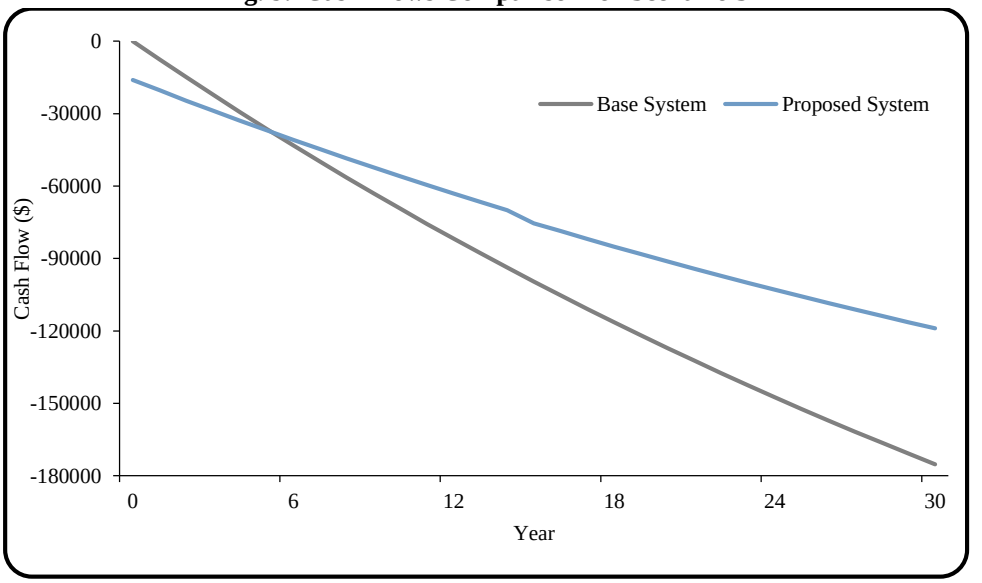
Component	Base System	Proposed System
Net Present Cost	$175,218	$118,903
CAPEX	$0.00	$16,048
OPEX	$7,665	$4,499
LCOE (per kWh)	$0.150	$0.0929
CO_2 Emitted (Kg/Year)	32,295	16,816
Fuel Consumption (Liter/Year)	0	0

The Levelised Cost of energy (LCOE) came out to be $0.0929/kWh, which is significantly lower than the existing grid-provided electricity tariff rate.

It is evident from the above analysis that the LCOE, which the end-consumer has to bear for only grid connection (0.15/kWh), would drop to $ 0.0929 $/kWh. Therefore, it holds substantial financial viability for end-consumers living in urban centres/housing societies.

Now, considering it from the perspective of the government, the need for investment planning for lesser energy/power, environment-friendly electricity generation, improving energy efficiency targets, and job creation in the private sector are some of its advantages. A graphical comparison of the base and proposed systems in terms of cash flows for the project lifetime is given in Figure 9.

Fig. 9. Cash Flows Comparison for Scenario 3



2.2. Further Insights into Modelling, Analysis, Simulation, and Results

It is important to highlight that the main purpose of the above-mentioned analyses is to present further insights and methodologies, which is why it has been performed only for a few of the selected cases and applications. The need of performing these analyses or even more advanced ones depends upon the exact application and model of a specific project, therefore, results may vary from one project to another.

2.2.1. *Sensitivity Analysis*

Sensitivity analysis is required to assess the impacts of changes in various input parameters on the results of the analysis. The most important input parameters for performing sensitivity analysis are:

- Permitted capacity shortage (%).
- Project lifetime (Years).
- Discount rate (%).

These parameters are allowed to vary over a range of values and the resulting impact on LCOE has been observed.
Based on the range of input parameters, a total number of 720 (12*6*10) scenarios/ sensitivities have been simulated through HOMER Pro for Case 1. Out of these 720 sensitivities, two are compared below as an example.

- Sensitivity A (Discount rate = 10, Project lifetime = 5 years, Capacity Shortage = 0 percent).
- Sensitivity B (Discount rate = 5, Project lifetime = 30 years, Capacity Shortage = 10 percent).

Table 4

Sensitivity A vs. Sensitivity B

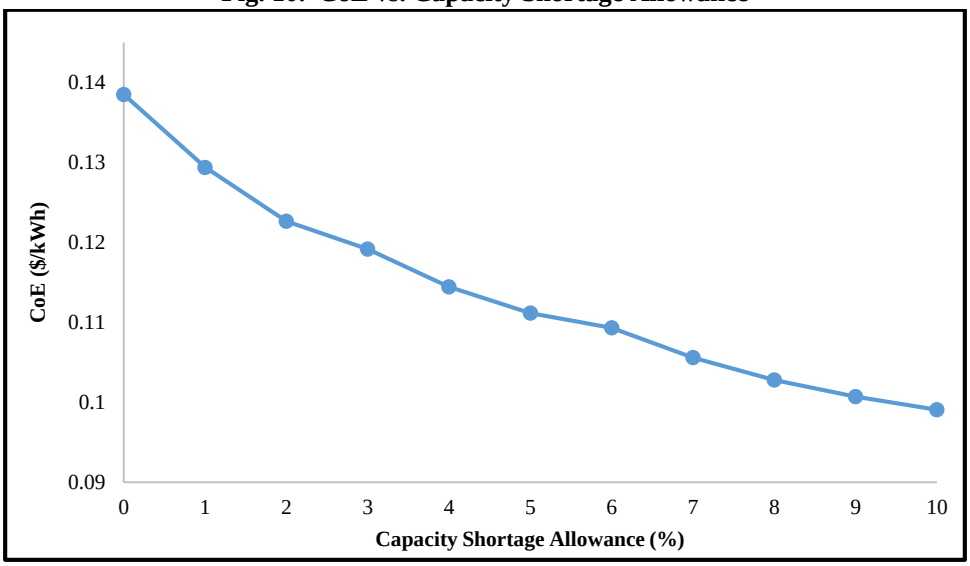
Component	Sensitivity A	Sensitivity B
Net Present Cost	$22,079	$83,957
CAPEX	$33,984	$25,841
LCOE (per kWh)	$0.177	$0.0729

It can be observed that the LCOE decreased either by increasing the project lifetime and the allowed capacity shortage or by decreasing the discount rate.

These sensitivities, along with other similar sensitivities, may be simulated for a specific project to identify the optimal solution as per the requirements. It is interesting to note that MGs' feasibility analysis is a multi-dimensional optimisation task where the project owner has to decide which energy mix will be installed to meet the electricity requirements of the consumers.

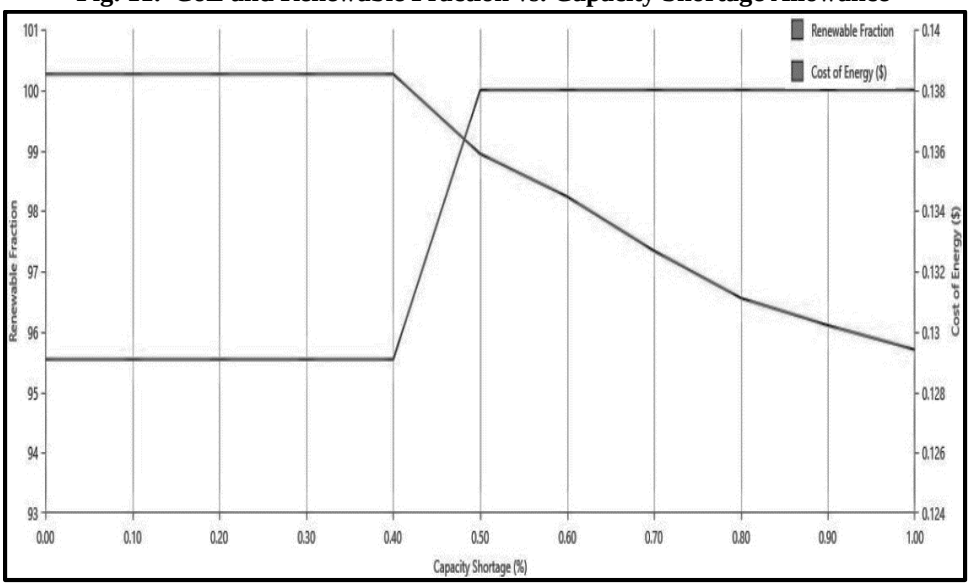
For example, let us consider the sensitivity of the cost of energy (CoE) with the capacity shortage allowance as shown in Figure 10. It is evident that the CoE decreased exponentially with the increase in the allowed capacity shortage.

Fig. 10. CoE vs. Capacity Shortage Allowance



An interesting behaviour has been observed concerning the renewable fraction in the energy mix for the MG. For a capacity shortage allowance of up to 0.4 percent, it is essential to include a conventional generator to determine the optimal resources for the MG, as shown in Figure 11. The corresponding graph for the CoE is also plotted below.

Fig. 11. CoE and Renewable Fraction vs. Capacity Shortage Allowance



Similarly, the relationship of CoE with discount rate and project lifetime can be easily observed as increasing linear and decreasing exponential respectively, as shown in Figure 12 and Figure 13.

Fig. 12. CoE vs. Discount Rate

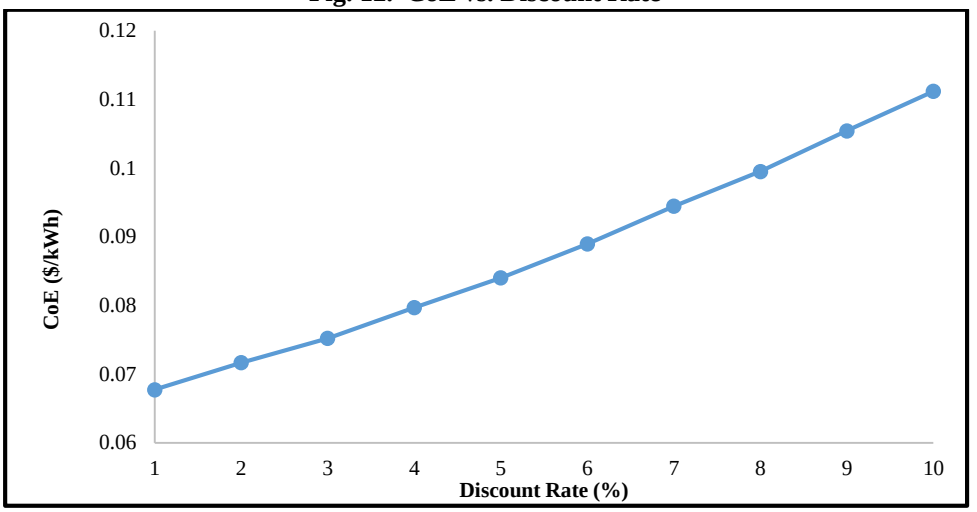
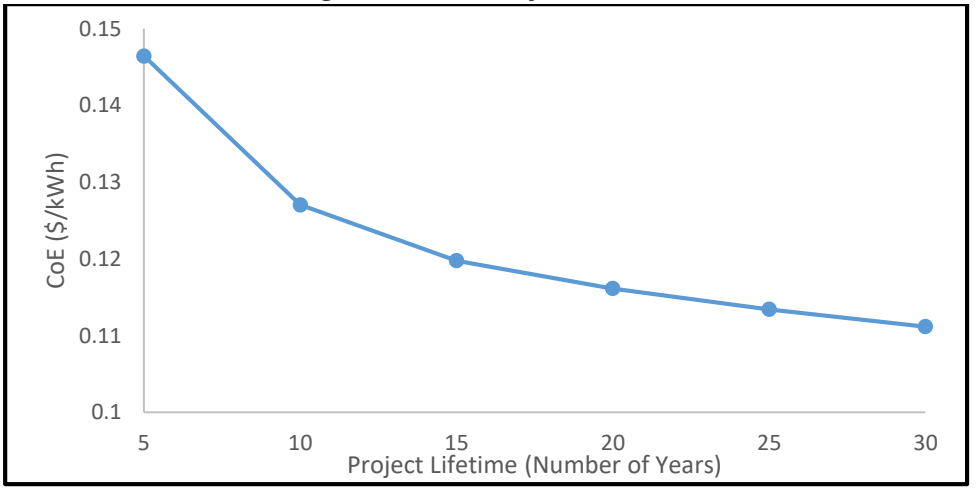


Fig. 13. CoE vs. Project Lifetime



The impact of these critical factors is an important insight for policymakers. For example, if the customers want the provision of supply 100 percent of the time, the price of per-unit electricity may increase by 200 percent as compared to the customers who want it 95 percent of the time. Again, this must be correlated with the consumer affordability index which varies significantly across the country. In line with the regulator's intent of deregulating this sector completely, it can be anticipated that it is the project owner who will conduct this sort of preliminary analysis to safeguard the investment, which would be depicted in the bilateral contracts between the project owner and the customers.

2.2.2. *Multiyear Analysis*

A multiyear analysis could be performed by inputting future cost projections of solar PV and wind to provide a more realistic insight for the future. It is important to highlight here

that the results summarised in the previous modelling section will improve, i.e., LCOE will further decrease if a multiyear analysis is incorporated.

2.2.3. *Deferrable Load Analysis*

Deferrable load analysis has been performed to analyse a very practical application of irrigation in Pakistan's rural areas. Deferrable load is the load for which the exact timing of the electricity provision does not matter. However, it requires a certain amount of energy in a specific period. Loads are normally categorised as deferrable when they are linked with the availability of storage. Water pumping is a common example of deferrable load in rural areas of Pakistan. Thus, this special case has been analysed here with respect to MGs' widespread deployment in the country.

A cost comparison of scenario with normal load vs deferrable load is provided in Table 5.

Table 5

Comparison: Normal Load vs. Deferrable Load

Cost	Deferrable Load	Normal Load
Net Present Cost	$64,059	$78,095
CAPEX	$28,999	$33,289
OPEX	$1,534	$1,960
LCOE (per kWh)	$0.0976	$0.119

It is evident from the above comparison that MGs application to irrigation is a feasible case and has more economic viability.

2.2.4. *DC MG Analysis*

DC MGs have become a reality in recent years. We compare the already presented Scenario 1 with another scenario in which we replaced AC with DC MG. Here the AC Load is converted to DC load, which resulted in avoiding the requirement of the AC bus and the converter. Without going into technical details, a brief cost comparison of the two is given in Table 6.

Table 6

Comparison: Scenario 1 vs. DC MG

Cost	Scenario 1	Scenario 1 (DC MG)
Net Present Cost	$64,120	$56,579
CAPEX	$27,836	$22,949
OPEX	$1,587	$1,471
LCOE (per kWh)	$0.111	$0.098

The Levelised Cost of energy (LCOE) turned out to be $0.098/kWh in the case of DC MGs as compared to $0.111/kWh.

2.2.5. *MGs with Day-Only Load*

The load profile significantly affected the LCOE. For example, when the load profile is changed to a day-only load, LCOE turned out to be $0.0677/kWh as compared to $0.111/kWh (in Scenario 1).

3. POLICY OVERVIEW AND REGULATORY FRAMEWORK

3.1. Analysis of Existing Relevant Policies

3.1.1. *ARE Policy 2019*

As per the ARE Policy 2019, MGs are included in the targets, i.e., at least 20 percent on-grid RE generation by capacity by 2025 and at least 30 percent by 2030. However, all MG projects, under the ARE Policy 2019, developed with public sector funding will be undertaken through competitive bidding. However, this condition will not be applied to private sector projects. The ARE Policy 2019 mandates the AEDB to be the focal entity for developing and operating MGs in Pakistan.

3.1.2. *National Electricity Policy 2021*

The policy, approved in June 2021, is aimed to reform the power sector. However, its aim is also to promote electricity access in areas where grid expansion is financially unviable, through exploring off-grid and micro-grid solutions. The policy further includes the provision of integrated planning for rural electrification and the provision of electricity to unserved areas of the country.

3.2. GAP Analysis

The ARE Policy 2019 is aimed to create a conducive environment for the sustainable growth of the ARE sector in Pakistan and is not exclusively meant to focus on encouraging and pushing MG development in Pakistan. In order to target substantial upscaling of MG, Pakistan certainly requires dedicated policy intervention due to its distinctive nature and associated benefits as well as challenges.

In order to promote and secure the upscaling of MGs in the country, the Government of Pakistan (GoP) is certainly required to address the policy gaps described below. Furthermore, the AEDB is required to proactively pursue its mandate in this regard.

The inclusion of exploring MG solutions in the National Electricity Policy 2021 in a highly broad manner does not reflect the strong commitment and serious undertaking on the part of the GoP for MGs development in Pakistan. It is, therefore, expected that the GoP will manage a comprehensive and realistic coverage of MGs in the National Electricity Plan, which is expected to be launched for the implementation of the National Electricity Policy 2021, covering the aspects, which are not limited to the following:

(1) What will be the roles and responsibilities of different stakeholders? For example, who will build, operate, and maintain the distribution infrastructure? What will be the role of the NTDC, and DISCOs concerning MG interconnections? What will be the role of provincial/territorial government, if

any, in the context of the 18th amendment concerning autonomy in electricity generation? What will be the role of donors and IFIs in the MG deployment in Pakistan?

(2) Will the tariff of MGs be regulated or not? If yes, what would be the ceiling on non-regulated tariffs assuming that very small MG will not be regulated?
(3) Will grid-connected MG projects be allowed to become distributors of electricity purchased from the centralised grid?
(4) How simple regulatory framework will be? Will a license be required to become an MG operator? If yes, will the license be required for all or only for MGs above a certain kW capacity?
(5) What will be the legal and regulatory framework, and mechanism for the acquisition and the utilisation of public sector land for MGs development and operation?
(6) Will the MG sector be subsidised or not, e.g. through the allocation of 100 percent free or partly subsidised public sector land?
(7) Will the private housing societies be allowed to have their own MG setup? Will they be allowed net metering or not? Up to what capacity if yes? Will licensing be required or not?

3.3. MG Experience in Pakistan

It is important to mention here that the MG development has already been initiated in a few geographical areas of Pakistan. In order to facilitate new MG projects, there is a need of showcasing the MGs' feasibilities, projects, technologies, ready-made business plans, financing options, etc. Moreover, an integrated study may also be carried out for the whole country with respect to potential and opportunities related to MGs. Master database may be prepared and shared widely (data of all the existing microgrids, potential for new such options, investment opportunities, funding opportunities, etc.) among the potential sponsors and other stakeholders.

3.4. International Experience of MGs Deployment

Here we will review various dimensions including prerequisites and other implications that may be faced in MG deployment in Pakistan. These dimensions are analysed by studying various case studies of MG deployment in Asian and African regions having demographics and economic conditions similar to that of Pakistan.

Three tiers in MG development have been identified to deconstruct the challenges: (1) decision-makers or policy-makers, (2) investors, and (3) consumers. Each of these tiers has its own set of barriers/constraints, which are required to be overcome.

3.4.1. *Decision or Policy-makers*

This is the most critical tier in the upscaling of MGs in Pakistan. Policymakers, which include regulatory institutions, must design and provide a conducive environment for investors and consumers of MGs. One of the key considerations should be that the tailor-made, bottom-up expectations of the customer meet the top-down decisions of the policymakers (Bijker, et al. 1987). Two fundamental questions are expected to arise

while designing this policy. The first is how the different tiers interact from the perspective of upcoming MG solutions. The second question is how different stakes associated with MGs, are managed by the local community and other stakeholders. (Bijker, et al. 1987 and Williams & Edge 1996).

In addition to considering the consumer side of the scenario, policymakers must address the investor side as well. They need to decide the level of participation from both the public sector and the private sector (Motjoadi, et al., 2020). The policy considerations for investors must include (1) long-term certainty in the market development; (2) addressing risks associated with the presence of a centralised grid; (3) meeting various regulatory requirements; and (4) providing sustainable operation and cost-recovery through tariff regulation and financial support schemes (Williams & Edge, 1996).

The international experience tells that it is important to have dedicated policies for MG deployment. The inclusion of MGs in the national electricity policy and plan may encourage the MG market. For example, Sierra Leone and Rwanda have dedicated policies for MGs deployment. Nigeria, Peru and Tanzania, have all included MG solutions in their plans.

Another critical policy-level issue is the MGs replacing conventional grids in their application areas and the strategies to deal with the stranded cost of transmission and distribution assets (Motjoadi, et al. 2020). The policymakers of Indonesia, Nigeria, Rwanda, and Tanzania, for example, have incentivised MGs operators to utilise net-metering provisions with the central grid at a fixed tariff, and to acquire distribution licenses, relocate assets or sell parts of their assets to the utility (IRENA, 2018).

3.4.2. *Investors*

Keeping in view a longer project life, a huge upfront investment is expected. The financial resources for setting up an MG system are presumably greater than the required investment for a diesel generator. Thus, for the implementation of MG systems, particularly in rural or remote communities, access to adequate capital is a major barrier.

There are two parts to this argument. Firstly, a sustainable investor-led MG business requires that the fixed and operational costs of the infrastructure and its operations be sufficiently recovered along with a decent return on the investment. Typical modes of revenue generation are connection fees and electricity sales. Secondly, the communities can pay the cost of services to the project owners.

Several ways are being exercised around the globe to ensure a smooth flow of capital from consumers to project owners, which include setting the right mechanism and the tariff for cost recovery, facilitation in project preparation, subsidising MG projects, and facilitation in access to finance and involvement of public sector in financing of community development projects.

In certain cases, policymakers allow project sponsors and the local community to set tariffs through mutual deliberation such that the tariffs are sufficient to cover costs but ensure that consumers are willing to pay. Increasingly, policymakers are taking a custom-built approach to set the tariff for MGs. For example, Nigeria, Rwanda, and Tanzania have allowed deregulated tariffs for MGs under an installed capacity ceiling. However, large MG systems require standardised tariffs, and such tariffs need to be approved by policymakers. Indonesia and Peru have prepared a methodology for standardising tariffs to encourage private sector involvement (IRENA, 2018).

The countries examined for this study show varying degrees of both public and private sector participation in MG development depending on the context. In Indonesia, the government has provided financial support in developing MG through subsidies and grants. The ownership remains with the public sector, while operation and maintenance are transferred to the community. In India, MG project sponsors are given a choice to opt for a pre-determined subsidy in exchange for other requirements including tariff restrictions, service quality, safety and security standards.

Investors, furthermore, fear that the presence of centralised grids may hamper MG development due to their superiority in ensuring a continuous supply of electricity.

3.4.3. *Consumers*

From the consumers' perspective, the need for energy may be of any type of end-use, such as for lighting, cooking, cooling, heating, irrigating, and charging. The need is to be decided by the consumer, which eventually drives the type of MG solution.

For the successful implementation of MG systems, a public-in-particular framework should be employed in which the communities have an identifiable stake. In such a framework, an issue, a controversy, or an internal difference can be solved or mitigated through technological endeavours. (Michael, 1998).

The consumer, whether the energy is clean or not, ultimately requires an uninterruptible supply of electricity. The case study of Bihar, India, clearly indicates that the hunger for more energy exists in the consumer, and they make an intended effort to go beyond the contracted energy needs. Such an increasing appetite for energy then drives consumers toward a centralised grid or the consumer may eventually claim their entitlement to the centralised grid (Sharma, 2020).

3.5. Policy Insights

Based on the existing policies, gap analysis carried out, and lessons learnt from the international experience of MG design, development, and implementation, the following are the certain policy insights that may be considered for the successful and large-scale deployment of MGs in Pakistan:

(a) A dedicated policy is critical to scaling up MG development addressing long-term certainty regarding market development, financial support schemes, and addressing risks associated with the presence of the centralised grid.
(b) Although MG deployment has already been initiated in a few areas, there is an urgent need for a regulatory framework to address various regulatory requirements, sustainable operation, and cost-recovery mechanisms.
(c) A meticulous identification of requirements becomes imperative in consultation with the local community to arrive at an MG solution. For example, in Balochistan or areas of Thar where there is currently zero access to electricity or any other form of energy, the requirement of energy from an MG system may, perhaps, be getting water from nearby wells, energy for cooling purposes, getting access to telecommunication services, or the internet for a significant part of the day. On the other hand, the requirements of energy use in Northern Areas of Pakistan are quite different as energy is mostly required for heating

purposes where one cannot rely on a hydro resource, which becomes simply unavailable or highly unreliable in the winter.

(d) Extensive stakeholder engagement is vital for moving forward. Stakeholder engagement may be achieved through the involvement of community-based organisations (CBOs), technology demonstration and its effective use, and knowledge creation and institutionalisation.

(e) As a recent development in the power sector (August 2021), the GoP has approved the exemption of a license for small-scale RE-based systems up to 25 kW for net metering to facilitate the consumers who wish to install small-scale solar systems for their homes and businesses. Similarly, the GoP and NEPRA preferably may develop and implement a simple and encouraging regulatory framework for the development of MGs in Pakistan.

3.6. Regulatory Framework

As mentioned in the previous sections, MG regulations are one of the critical prerequisites in achieving widespread MG deployment in Pakistan. Fortunately, in December 2021, when the present study was in progress, NEPRA published the draft licensing regulations for MGs and sought comments from all the interested parties.

Accordingly, the study team interacted with NEPRA and subsequently submitted a comprehensive set of comments and observations via email (For reasons of conciseness, we will not mention our comments here). The finalisation of the regulations is under process. The regulations are expected to be approved and enforced in the coming months.

4. BUSINESS MODELS FOR MGs

4.1. Existing MG Activities in the Country

Although the MGs have started being recognised by the Government of Pakistan mainly through the recently enforced ARE Policy 2019, there are proactive interventions already in place at the provincial levels.

The Government of Khyber Pakhtunkhwa (KP) has a major focus on the social uplift of the deprived communities residing in far-flung areas of the province. In this regard, they have carried out three projects, i.e., (a) the development of mini/micro hydropower plants; (b) the Solarisation of schools and mosques; and (c) the installation of solar mini/micro energy systems. For all these three projects, the project sponsor is the Government of KP, the executing agency is PEDO, and the energy systems are managed by the local community. The objectives of these interventions are to increase economic activity in the region, create employment opportunities, utilise the local resources for the community optimally; and supply low-cost, locally managed, clean energy. Within the KP Province, 356 mini/micro hydropower projects, ranging from 15 kW to 500 kW, are located. The MG infrastructure comprises 175 kW solar PV, 250-300 kWh lithium-ion battery system, and an AC transmission system to connect with the consumers.

The Government of Punjab has also adopted a similar approach in the development and deployment of MGs in the province. The focus of Punjab is primarily on solar. PPDB has already managed to solarise 2,324 basic health units in Punjab and plan to expand it to schools in Southern Punjab. In a bid to reduce the carbon footprint, the Government of Punjab is the first to introduce a business model, Energy Service Companies (ESCOs), in the province. This

initiative started with the solarisation of public universities in Punjab on the ESCO model. For this model, CAPEX and OPEX will be borne by the ESCO and the buyer will pay ESCO on a mutually agreed tariff. Major universities that are being benefited from this model include the University of Engineering and Technology, Lahore, and Islamia University Bahawalpur. The ESCO model has now been expanded to various commercial buildings as well as industrial facilities.

4.2. Potential Business Models

The MGs being installed or commissioned in the country are currently unregulated and unstandardised, and major interventions have been done by the government through International Financial Institutions (IFIs) with increasing CAPEX, but no plan to sustain the OPEX.

Any successful business model must possess three key features, namely scalability, interoperability, and sustainability. For this study and based on the ARE Policy 2019, National Electricity Policy 2021, and draft NEPRA Licensing (Microgrid) Regulations 2021, business models are envisaged that capture the future outlook of MG business activities in Pakistan.

Figure 14 provides a model where a government entity becomes the MG licensee and undertakes to plan, design, construct, operate, and maintain the MG infrastructure along with associated generation. This is the existing structure in which the government is investing in a bid to provide economic stimulus to the deprived communities. However, in this model, there is no room for scalability and sustainability of the MG deployments.

Figure 15 shows an investor-owned MG business model, which is based on the prevailing policy and the draft regulation. This is similar to the first model shown in Figure 14, but in this model, the private sector undertakes all the activities of planning, design, construction, operation, and maintenance. For this model, a major concern remains that the investor is deemed to have a monopoly on supply in the specified service territory.

Fig. 14. MG Business Model 1 – Utility Owned Model (Generation + Wire Business)

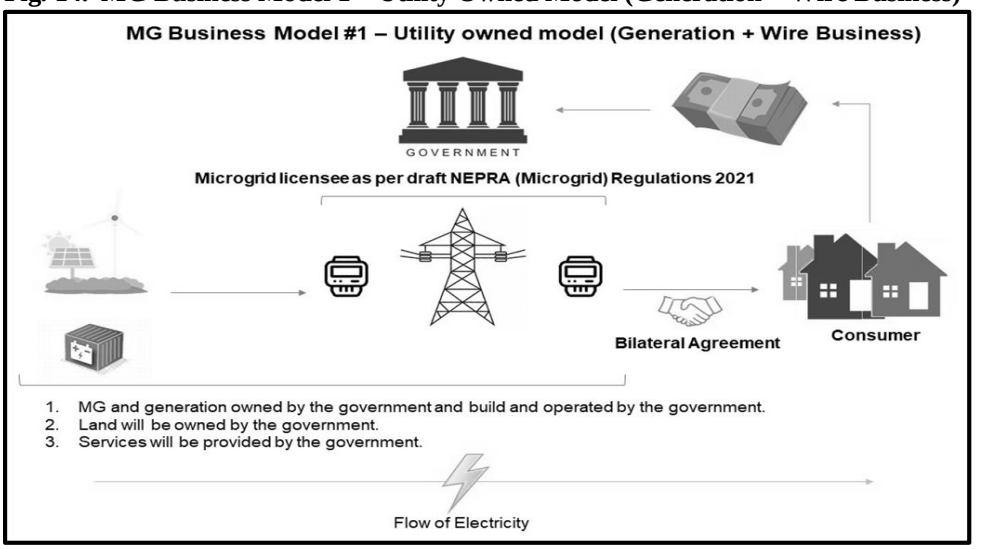
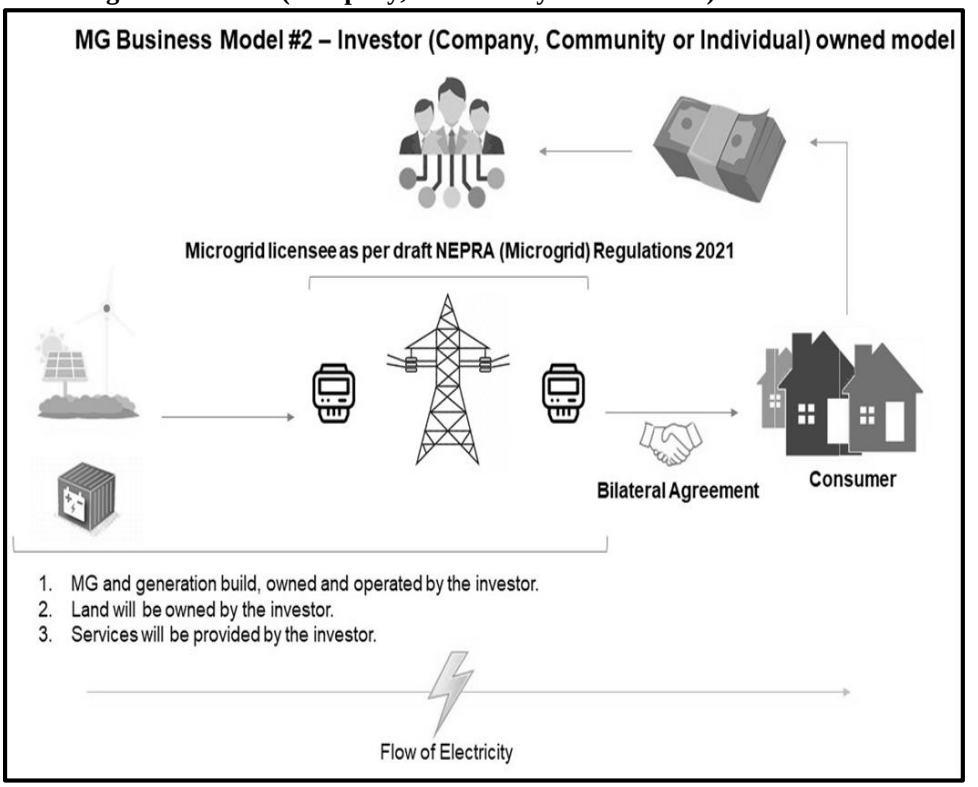


Fig. 15. Investor (Company, Community or Individual) Owned Model



The business models, as illustrated in Figure 16 and Figure 17, have been proposed for the upcoming MG enterprise, which will outperform the existing and unsustainable business frameworks, increase private sector participation, provide effective operation, and maintenance and ensure more transparency and sustainability in the energy system.

Figure 16 shows an investor-owned model, which is more decentralised allowing more competition and increased private sector participation. In this model, the MG licensee owns the wires and metring infrastructure. Generators in IPP mode supply electricity, which is contracted through Power Purchase Agreements (PPAs). This constitutes the CAPEX of the MG energy system infrastructure. The OPEX part of this model is undertaken and monitored by a Community Based Organisation (CBO), which manages the distribution network and the flow of power from the generator to the consumer. Furthermore, it manages metering infrastructure for the sale and purchase of electricity and provides authorised services to consumers through bilateral agreements. The CBO also acts as a power purchasing agency, which collects the payments from the consumers and disburses them to the wire business owners and the generators. This model manages the community's ownership, making the system more sustainable for a longer period. The CBO includes representation from generators, MG licensees, and the community itself.

Fig. 16. Investor-owned Model with Involvement of CBO

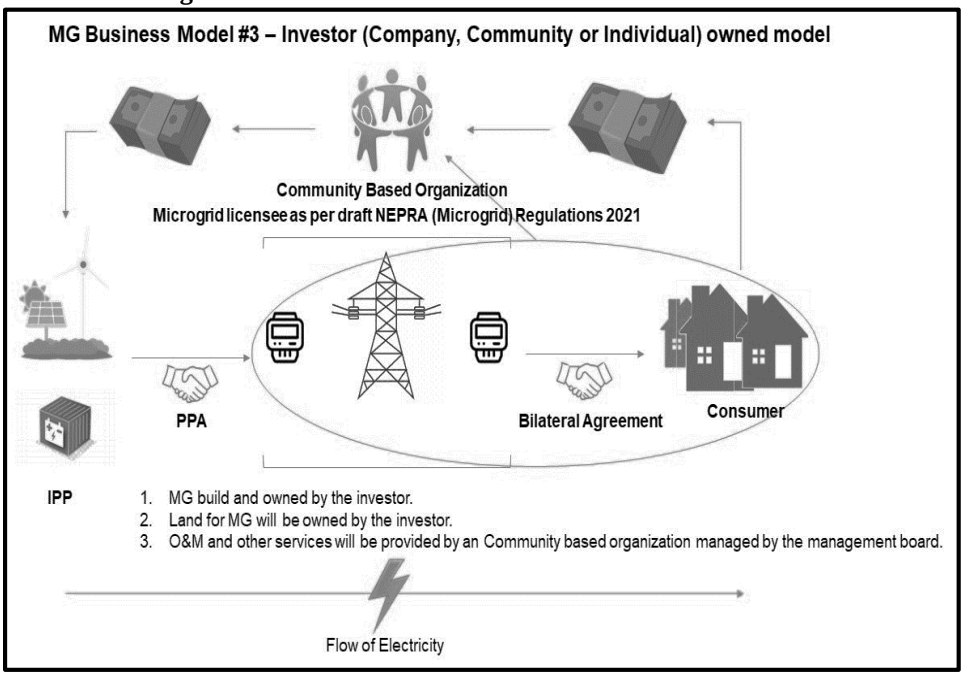
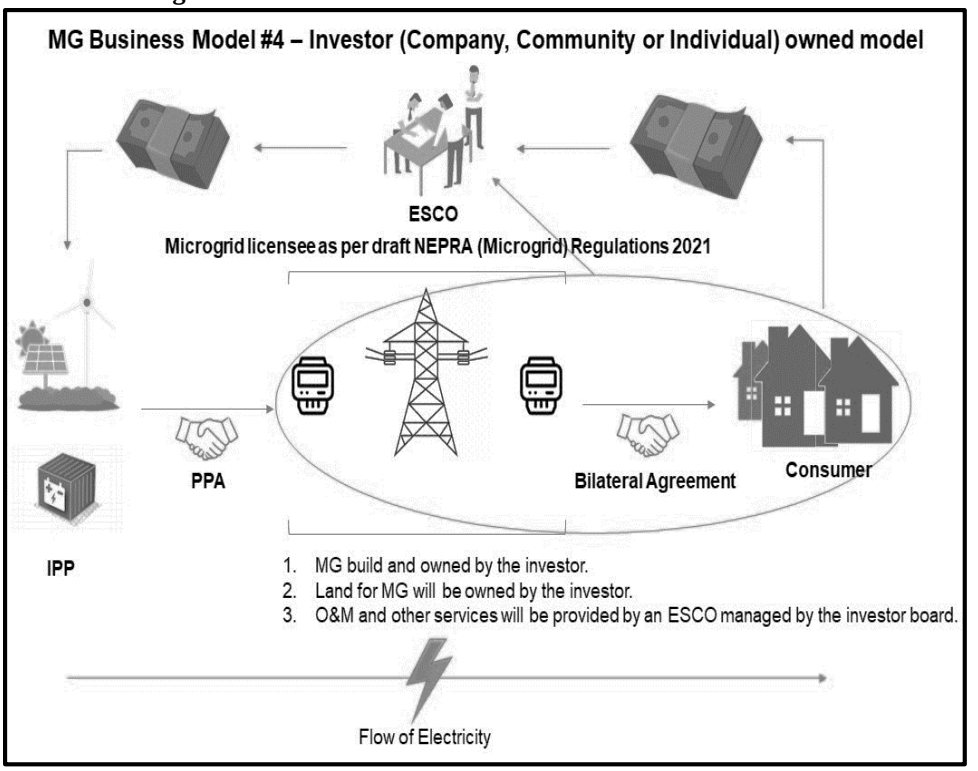


Fig. 17. Investor-owned Model with Involvement of ESCO



A similar approach is adopted in the business model displayed in Figure 17. However, the mandate to operate and maintain the MG infrastructure is transferred to an ESCO, which can be applied for more advanced network control and operations. The ESCO also acts as the power purchasing agency, which manages the sale and purchase of electricity. The ESCO is governed by an investor board, which includes participation from generators, MG licensees, and the community.

The success of any of the business models discussed above is subject to the underlying issues regarding the arrival of the host distribution licensee grid, the stringent regulations even for investors in the range of less than 100 kW, and SOPs on billing and metering to be made by the electricity regulator. These issues are potential impediments to the economic stimulus in the MG business growth in Pakistan.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

(1) The comparison of different applicable MG scenarios as discussed and analysed in Chapter 2 is provided in Table 7 below:

Table 7

Summarised Comparison of Scenarios

Parameter	Scenario 1	Scenario 2	Scenario 3
LCOE ($/kWh)	0.111	0.0981	0.0929
Net Present Cost ($)	64,120	78,068	118,903
CAPEX ($)	27,836	34,213	16,048
OPEX ($)	1,587	1,918	4,499
Fuel Consumption Savings as Compared to Diesel Generator (Litre/year)	15,216	16,151	–
CO_2 Emissions Savings as Compared to Diesel Generator (kg/Year)	39,831	42,276	15,479
IRR (%)	79.5	66.1	20
Payback Period (Year)	1.34	1.57	5.22

(2) The MG deployment has strong financial viability and presents a lucrative investment opportunity. The upscaling of MGs, therefore, needs to be acknowledged as a business opportunity by the private sector.

(3) Fuel-based MGs result in CO_2 emissions, which is detrimental to the environment. Renewable Energy (RE) based MGs save significant emissions and are, thus, environment-friendly.

(4) RE-dominated MGs present much more financial feasibility as compared to fossil-fuel-based MGs.

(5) Due to the increasing trend in electricity prices, the MG deployment has become a cost-effective solution as compared to the conventional integrated grid for particular scenarios/applications.

(6) The MG option is better than the conventional integrated grid for specific scenarios/applications discussed above. However, it is not an optimal solution in all situations. The feasibility will change significantly depending on various factors, such as no or lesser renewable energy (RE) potential, consumer requirement of 0 percent allowed capacity shortage, and change in cost trends of REs versus fossil fuels.
(7) Technical issues associated with the operations of MGs are stability, safety, protective relaying, harmonics, and voltage imbalance. Although MGs present a cost-effective solution for remote unelectrified areas of Pakistan, they may face technical issues if not properly designed.
(8) Keeping in view Pakistan's context, customised business models may be helpful for investors and other stakeholders.
(9) The existing policy and regulatory framework are insufficient to effectively upscale the MG deployment in Pakistan.
(10) DC MGs have become a reality in many countries in recent years. DC MGs show a promising 12 percent decrease in the cost of energy (from 0.111 $/kWh to 0.098 $/kWh) as compared to similar AC MGs.
(11) The application of MGs for irrigation purposes presents an interesting case. Hybrid MGs having an irrigation application has more economic viability as compared to similar normal rural MGs since it shows a promising 18 percent decrease in the cost of energy, i.e., from 0.119 $/kWh to 0.0976 $/kWh.
(12) Allowed capacity shortage is an important factor to be considered for MG development since the cost of energy decreases exponentially with the increase in the allowed percentage capacity shortage.
(13) Discount rate and project lifetime are important factors to be considered to evaluate the feasibility of MGs. The cost of energy (CoE) increases linearly with the discount rate and decreases exponentially with the project's lifetime.
(14) Allowed percentage capacity shortage significantly affects the energy mix decisions. With the consumer requirement of percentage allowed capacity shortage from 0 percent up to 0.4 percent, the inclusion of conventional generators in the optimal energy mix is essential, and cannot be achieved exclusively with renewables and storage systems.
(15) The demand profile significantly affects the CoE of an MG system. In case the demand profile is changed from 24 hours to 12 hours (day-only load), it shows a promising 40 percent decrease in CoE from 0.111 $/kWh to 0.0677 $/kWh.

5.2. Recommendations

(1) For the upscaling of MG development in Pakistan, a comprehensive policy is required for addressing the long-term uncertainty of market development, financial support schemes, and risks associated with the presence of the centralised grid. Furthermore, a regulatory framework is required to address various regulatory requirements, sustainable operation, and cost-recovery mechanisms.
(2) DC MGs should be included in the regulations on microgrids, to be launched by NEPRA. Similarly, MGs should also be allowed to operate in grid-

connected mode. For this purpose, the draft regulatory framework may be customised. Moreover, a mechanism for dealing with the technical issues, such as stability, safety, protective relaying, harmonics, and voltage imbalance associated with MGs should be addressed in the final regulations on microgrids.

(3) Coordinated efforts by the stakeholders are required for utilising the applicability of MGs for irrigation in remote rural areas.

(4) While assessing the electricity provision for remote unelectrified areas of Pakistan, the system planner must consider and evaluate the MG deployment before proposing huge investments for transmission and distribution infrastructure.

(5) Based on the study's findings, the optimal solution involving MGs includes a major share of renewable energy resources. Therefore, renewables-based MGs should be promoted in the upcoming policy and regulations. Further, CO2 emissions should be compensated through a carbon-credit mechanism for fossil fuel-based MGs to be provided in the upcoming regulatory framework.

(6) Given an inverse relationship between CoE and the allowed capacity shortage, the design of MGs should be aligned with the affordability for the customers in the specific geographical area, to create a win-win situation for all the stakeholders.

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Policy

Lahore's Urban Dilemma

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MADEEHA QURESHI, and FAHD ZULFIQAR

1. CONCEPTUAL ISSUES

The rules currently are too complex, detailed, often self-contradictory, and subject to multiple interpretations. The permissions and procedures written therein can slow down development as envisioned by PM for the welfare of the country.

Building and zoning rules are conflated. Building rules are mainly for safety and curbing environmental externalities. In this regard, setbacks and heights are arbitrarily related to plot size and road width. The land-use rules and zoning regulations continue to favour outdated concepts such as commercial roads based on car access over denser cramped areas, such as Misri Shah and Baghbanpura. The planners also hold Gulberg as a favourite; as opposed to where the people are densely cramped.

Zoning needs to be relaxed. Lahore needs to stop sprawling to suit a car lifestyle that subsequently pollutes and leads to a scrapped congested lifestyle. Zoning should merely differentiate between the city centre and suburbs.

With a large city like Lahore, the city centre might even be from Model Town to the Walled City and from Cantt to Samanabad.

Suburbs are the schemes outside this designated city centre area.

Micro-managing within these areas lacks clear-reasoning and provides a basis for the rent-seeking game through permissions. Building by-laws or regulations written therein should concern themselves only with technical performance demands of a building (safety-fire, structure, etc. and environmental function).

Box 1. Dividends from De-regulation in Lahore

Being the second-largest city, will Lahore give us about 0.5 million homes in the next three years?

With PM's vision of building 0.5 million homes, we need people to move to flats. Sprawl is already destroying clean air and a decent life. Will this new regulation give us flats in high rises abundance?

There is also an extreme shortage of office space, leisure space, school space, and space for many other usages. Will this new regulation facilitate that?

The economy is in recession, with per capita incomes declining and unemployment crossing 20%; the country needs a construction boom. There is an urgent need to deregulate so that economic activity can quickly pick up.

The city's social, economic, and political requirements, which come under 'city planning and zoning,' need to be separated from building requirement.

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Area-specific requirements must be accompanied by a detailed plan/map available on the neighbourhood level, and on the internet for transparency.

We need principles to back the regulations.

Lahore is a sprawl that has not provided for the needs of its citizens. The need for the hour is to recognise that over-regulated city planning has been responsible for the mess. Due to lack of clear principles, overly interventionist, confusing and conflicting regulations in the most inner-city areas which in turn has favoured sprawl, the residents have low slung messy city stretching from Kasur to Gujranwala where there are massive shortages of space.

PIDE and other participants at the meeting, therefore, urged LDA to clarify the principles behind zoning and building regulations and let such principles be the guidelines.

Further, during the consultation, it was agreed that such guidelines by LDA must be minimal, short, and clear. The guiding principle of lengthy detailed LDA guidelines, requiring a lot of interpretation, will slow down work; create an insider market and lead to a lot of court intervention.

1.1. Fragmentation of Lahore

The issue persists across the cities, and Lahore is prima-facie. LDA only regulates and develops a small part of Lahore. Local government continues to elude us. The CM office can proactively help coordinate building and zoning deregulation across Lahore. This will require negotiating across many jurisdictions. If CM office leads; PIDE and our collaborators will extend assistance.

Box 2. The Crying Need to Integrate the City

- LDA represents only 20% of the city.
- 5 entities regulate Lahore with different rules and without citizen participation and representation.
- LDA is to be congratulated for this effort to follow cabinet instructions. Other entities regulating Lahore have not shown any initiative yet.
- Only the Chief Minister's office can coordinate these entities. We are thankful to Salman Shah Adviser finance for taking up this initiative.
- Coordination between these governing arrangements that make city development difficult will have deep repercussions for city development and eventually, economic growth. We urge the government to take up this issue of city fragmentation that slows our economic growth as a matter of national security.

1.2. Cooperation of Agencies

The agencies including LDA, TMA, LMC, PHATA, and DHA consider each other competitors; but to have a constructive Lahore plan, they must be cooperative to establish institutional tools to create high-rise plans for Lahore.

Box 3. Shortage of Needed City Space

The planning paradigm of Pakistani cities is:

- Low rise (4-floor commercial areas) along wide roads
- Single-family houses, and
- A priority to cars: very-widening roads with flyovers and high-speed lanes.

The result has been that the Single-Family home has become the unit for the economic activity taking on all activities such as:

- Schools
- Leisure space
- Shops
- Offices
- Restaurants
- Warehouses

Hence it can be concluded that masterplans for cities within Pakistan have failed to recognize the variety of human needs or the growing population in cities. Instead, the preferred approach has been to force people into tight fantasies of planning divorced from emerging needs, technologies, or changing lifestyles. The result is that neighbourhoods, needs, and requirements wage a constant battle against the poor planning standards that are set up.

Courts have jumped into the game without any idea of what the sociology or economy of a city is. A developing country like Pakistan is, therefore, wasting real resources with businesses and livelihoods being destroyed and transaction costs inordinately rising as courts and planners try to enforce unrealistic and fantastic standards. This thoughtless planning is detrimental to economic growth.

2. LEGAL FRONT

The advertent court decisions have impeded the execution of the project, one of getting around these things is to simplify rules with no ambiguity; thus, not giving courts to interpret differently.

The government must consider taking a jibe at pending bills. As discussed in the meeting, the Condominium act and others are in process to be passed. These are to be addressed and moved efficiently as per recommended in consultations.

3. OUR PRINCIPLES FOR SIMPLIFICATION

We defined four principles for building regulations.

- FAR.
- Building Intensity.
- Sky Exposure and Air Flow Guidelines.
- Car and Mobility.

4. FARS AND HEIGHT RESTRICTIONS

In the regulations, it was agreed at the discussion that FARs are too tight to meet with what the cabinet has in mind. The recommendation of this group is at least to relax them by at least a factor of 2, i.e., double them.

Like most jurisdictions in the world, it is time that LDA must give up height restrictions. There are many reasons for this, such as

Height restrictions lead to box-like building structures as builders seek to use maximum space. There is no room then for diversity and beauty.

Maximum use of the plot is then utilized leaving no room for green spaces.

The city has a uniform skyline with a uniform sky exposure plane with areas that are not exposed to the sun. This leads to health and environmental issues.

Rather than boxes we recommend FARs only with Sky exposure guidelines.[1]

5. BUILDING INTENSITY AND SETBACKS

The regulation does not explain the need for setbacks. It merely states them quite arbitrarily.

If road widening setbacks are to be kept, they should be uniform in an area and not by plot size. Then there should be no boundary walls.

Road widening setbacks and all location-related provisions should be a function of land use and zoning "controls" or regulations and not of building by-laws.

5.1. We need to Define Building Intensity Use!

The city must define the percent of land that is usable for construction with zoning determining setback for the area with released land for use as sidewalk (no walls) and let architects and builders decide.

[1]Please refer to upcoming Section 6 for details.

6. SUN EXPOSURES AND FLOW PROVISION

Sun Exposures and Flow provision of sun exposure angle should be included in the building regulations, and its implementation should be ensured through building approvals for new construction. A building has to be built within the intersections of these angles. Adoption of this approach would eliminate the need to link road width with building rules.

7. CARS AND MOBILITY

There is no reason to link denser construction by street width. We need density in areas and not according to car use.[2]

Previous laws have created a city for cars; given the liberal space, they allow for cars, even in buildings. Law of induced demand is not considered that if you build more roads to tackle congestions, soon people will be inclined to buy more cars.

We need to liberalize parking within the building because we want to let more poor people purchase flats. In our view, the minimum parking requirement should be 4000 sq. ft for a parking requirement. This will allow some parking and builders to sell it separately from flats, or we need to introduce the city's mobility and parking policy without which we are dedicating cars parking spaces.

Box 4. Parking Requirement is Anti-Poor and Ill-Conceived

People must have the option to buy a flat without parking. PM and Cabinet's vision is for the poor and middle class to have a house. In opposition to this vision, the parking requirement raises the cost.

- Parking in building costs developers $5,000 or more per space.
- Underground or structured parking from $20,000 and 50,000 per space.
- A tighter parking requirement forces all to pay for parking.
- Even poor or middle class who may not want to own a car are forced to pay for space

—Estimates from Builders

Box 5. City authorities must recognise that a car is not the only form of transport. Others include

Walking,
Bicycles,
Elevators in mixed-use,
Market responses like Rickshaw, Wagons, Uber and Swvl,
Motorcycles,
Carpooling,
Buses and public transport,
Other private arrangements.

In Pakistan, the Planning paradigm ruled out everything else but cars. These different forms of transport should share the street. Yet here only cars are given street space.

Instead, the city needs a car policy beginning with paid street parking in designated zones, congestion, and speed tolls. Safe city cameras will facilitate this policy easily to raise revenue for cities, and rationalize street usage.[3,4]

[2]Please refer to upcoming Section 9 for details.

[3]Private housing schemes rules in Pakistan still favour single plot making (low-density development) and have a provision of only 10 percent of housing units to be accommodated in apartment buildings. In contrast, a model for a sustainable development project in Germany (Kronsburg Ecological District, Hannover) provided 90% housing stock in high rise apartment buildings and only 10 percent as single plotting housing units. This policy not only created the options available for everyone (poor and rich), but the results afterward show a significant improvement in the reduction of carbon emissions. It must be noted in Pakistan exactly a reverse case has been promoted of horizontal rather than vertical spread.

[4]This is easily visible when you see the number of such activities housed in single-family homes–a clear indicator of the shortage of dedicated space.

8. URBAN SPRAWL

The proposed rule does little to curb sprawl that is stressing infrastructure, air quality, and city life. The sprawl has been hugely costly (even though the ostrich-like cost of it has been ignored). Most housing schemes have taken decades to develop, many have folded up, leaving fraud and litigation behind, and most have been nothing more than mere single-family homes for the rich. Not to mention the enormous load on city infrastructure that is stretched out far more than would be manageable without adding to fiscal stress in the medium term.

Given the experience with sprawl and poor performance and housing schemes at a huge cost to consumers, LDA should make public an independent evaluation stakeholder of its sprawl policy as well as its excessive inner-city controls.

The new guidelines do not commit to stopping the sprawl. Should new housing schemes not be stopped? Builders are heavily invested in sprawl and find it easy to deal with LDA using consumer funds for decades without consequence. Should the situation be allowed to continue?

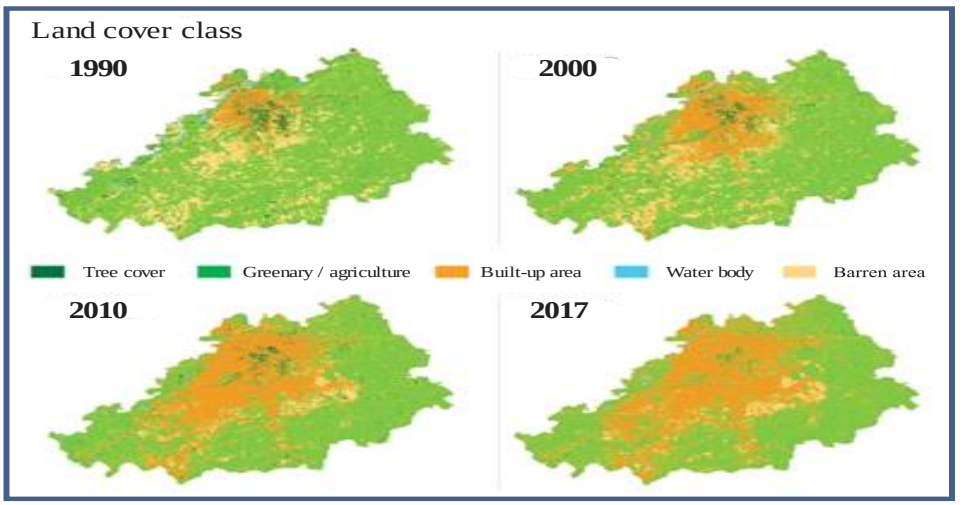
Previous LDA policies have created a huge shortage of commercial, office, public, leisure, education, and community spaces. A policy of promoting compact development cannot work alone if we are not discouraging policies for sprawl development.

Given that the consumer is bearing the cost of urban sprawl, and hence the utmost priority of contractors remain towards sprawl.

The mission of LDA must not be reductivist; to issue permits and allow sprawl.

Therefore, perhaps this is the time to call a halt to more housing schemes.

Fig. 1. Urban Sprawl in Lahore Credits. Hammad Gillani and Adeel Ahmad



9. ENHANCING MOBILITY

For the last 40 years, city-planners' romance with the car has destroyed a reasonable working bus system that most citizens of Lahore can remember. Roads have been widened, flyovers, and underpasses have been liberally sprinkled across the city. Pedestrians and other forms of mobility have been killed to make room for the car.

Subsidizing the car as we have done for the last 40 years only taxes these other forms.

As noted above, Lahore needs a car policy beginning with paid street parking in designated zones and congestion and speed tolls. Safe city cameras will facilitate this policy easily to

- Raise revenue for cities, and
- Rationalise street usage.

Even the metro has been poorly designed to favour cars.

A complete redefinition of an informed mobility policy will help the residents and city and national budget.[5]

Box 6. Legal Framework for a Real Estate Market

Regulatory agencies like LDA should give us the legal framework for developing a real estate market.

- Even in 2020, there is no clear property titling arrangement. As a consequence, transacting in real estate remains very costly in time and money. Regulation should develop a credible and low-cost property titling and exchange framework.
- There is no multiple ownership or condominium law.
- The rental framework needs to be strengthened to allow the market to favour all, especially the poor.

10. PERMISSIONS

LDA has provided a provision that a developer may go to provide apartment buildings on residential plots (by application), but the procedure is complicated, costly (as to provide NOCs from TEPA for TIA studies and WASA) and thus discouraging. There is no reason for such permissions for individual buildings. This should be across zones that various authorities must make the infrastructure provisions.

In a high-rise building, along with ease-of-doing-business, the cost-of-doing business must also come down that includes the permit fees, registrations, and time-cost of the procedure.

11. MIX USE BUILDINGS

Why are high-rise buildings classified in different categories such as apartments, commercial buildings, and public buildings? High-rise buildings can be multi-purposed or mixed-use buildings and should collectively serve all purposes so as to reduce ambiguities.

Currently, families are congested. Extended families live in one or two-room accommodation thanks to stifling LDA rules. Mixed-use buildings can be a solution to this problem.

This liberalization should not be as in the past to favour the rich. LDA insisted on only favouring Gulberg as well as only 4 Kanal plots when CM Shahbaz Sharif agreed to a high rise on Nadeem Ul Haque's recommendation. We should not repeat the same mistake. Let all small plot-holders also benefit from liberalisation.

Contrary to the Cabinet's objective of creating pro-poor housing options, the plot size with height suggestion is merely favouring the rich against the poor. We must allow all to go to a certain floor area ratio in large zones. But the reason for defining zones must be clear.

[5]The car subsidy policy has resulted in excessive road expenditure as well as a poorly designed and expensive public transport policy.

The critical issues anticipated with the culture of high-rise buildings are that of sanitisation and amending the LESCO rules about establishing grid-station. A coordinated approach is a prerequisite to creating any plan concerning the development of Lahore or any part of this city.

In the planning process, it is crucial to loop-in the pollution factor proactively. The cost of pollution will come down with lesser average transportation costs by virtue of high-rise.

Energy efficiency must be the key decisive factor in designing of high-rise buildings, as it can prove to be the most critical cost-effective factor, amongst others, against urban sprawl.

12. MARKET RESPONSES

Like all planners, our city planners fear that inducing loose controls will create mayhem. For example, allowing height would mean everyone will immediately go to maximum height. They forget that:

- It takes time and money to build;
- Costs rise exponentially as height goes up. Hence not everyone will go up to maximum.
- The market will indicate what should be built in every location and owners and builders will have to take the market risk.
- Regulations must be such to give people enough room to make decisions and not go to the maximum of all regulations. The former is what killed the Soviet Union; the latter leads to growth and employment, the crying need of the time.

13. MULTIPLE OWNERSHIP

After the incident of Margalla towers, Islamabad unfortunate fall-down in the wake of the 2005 earthquake, there is a rising concern to promote multiple ownership.

Multiple ownership is undeservedly missing and under-supported. In order to increase the investment in high-rise buildings, the state must facilitate the mechanisms to promote this mode of ownership.

Box 7. Legal Framework for Encouraging Commerce through Mix-use Buildings

Urban centres should not be just a place of residence but of trade and economic activity. To promote such commercial synergies through mix-use high rise zones, regulatory authorities, such as LDA, should impose a positive legal framework on such zones:

- That is, a law should be framed that makes all sorts of commercial and industrial activities permissible within high rise zone except those that are negative and harmful,
- What should be negative and restricted by law can be debated and implemented after deliberation with the necessary body of technocrats.

Source: Minutes of PIDE's consultation with LDA at Chief Minister Office.

14. EMPLOYMENT

If parking is not provided in building and street parking is charged, the business of parking will start to create employment.

A building boom following deregulation will give a much-needed boost to investment and employment.

There will be many multiplier effects of this liberalisation as complementary products and services will create new markets.

City regeneration which has been on hold for decades will trigger off many supply-side effects that are critically needed.

We can already see market responses like Uber, Foodpanda, Swvl developing to serve density. We need to unleash such creativity, which city deregulation will foster. But for that to happen, planners must loosen restrictions to allow the market to work. Let investment happen liberally. This is the crying need of the day.

15. PRO-POOR DEVELOPMENT

If the supply of flats is increased, low-cost flats will happen. This will alleviate the middle-class housing shortage. The very poor may still not be served. For that policies might need to be developed based on the market.

We need not only poor housing but room for "commerce for the poor" such as street vending and micro-vending spaces.

LDA and agencies like it need to step away from land development and develop a good legal framework and regulation for the development of the market. Work must begin in earnest to develop the laws listed in the box above.

In LDA's attempt to high rise and ensure the provision of housing space for the citizens along with creating employability, following impediments to high-rises were identified:

(a) Fire safety standards do not allow the high rise on roads less than 40 feet.
(b) Infrastructure development agencies such as TEPA, WASA, Sui Gas, and Electrification have operational limitations.
(c) Rescue 1122 is not willing to make part of high-rise buildings.
(d) Strong criticism from the media and professionals to promote a high rise.

In the light of the above-stated issues, it was proposed in the meeting that

(1) Integrated approaches are needed among organisations such as TEPA, WASA, Sui Gas and Electrification to ensure changes that facilitate high rises.
(2) For the 20 percent area of Lahore which is amenable to dense high-rise, the supply of services (such as water and electricity) should be ensured.
(3) Liberalisation and de-regulation are essential for making the landscape of Lahore and other cities more inclusive and eclectic.
(4) The square feet requirement for the room has to be revisited.
(5) The contradictions within the regulatory frameworks need to be rectified.

TAKEAWAYS

(1) If we want growth in the country, liberalize FARs and real estate.
(2) The real dilemma is that in Pakistan, cities are planned for cars, not for people.
(3) There must be a car policy in Pakistan.
(4) Mixed-use high-rise should be encouraged.
(5) Urban regeneration is missing in the LDA documents.
(6) Infrastructure should not be a bottleneck for the growth of the city; it should be an engine of growth.

(7) In high-density areas, rules/regulations should be clear and short. In such areas demand clearly shows people want dense and mixed-use living. Let them have it.
(8) There should be no superfluous regulation. Simplification can be achieved if we follow four simple guidelines.

Floor Area Ratios (FARs) not heights. For example, when Floor Area Ratios (FARs) are specified, why have building height requirements? Most architects and informed people recommend only FARs and no height restrictions.

No detailed building setbacks are required. Let us think of building intensity, i.e., percent of plot that can be covered. This too should be area by area not building by building.

In high rise areas, Sky Exposure and Air Flow Guidelines are given to ensure sunlight and airflow.

Cars are the city's problem as is mobility of people. Imposing parking requirements to be borne by builders and buyers is anti-poor. City urgently needs a Mobility policy to accompany building and zoning regulation. Cars should not be linked with housing and business.

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The Islamabad Master Plan

LUBNA HASAN, AQEEL CHAUDHRY, AYAZ AHMED, and HANZLA JALIL

Islamabad slums besides posh locality in F-7/4. *Photo Credit: Tanveer Shahzad*

Islamabad is currently in the process of reviewing its master plan. Like most cities in the developing world, Islamabad is facing insufficient public utilities, lack of affordable housing, commercial and office space, decaying public infrastructure, illegal and haphazard development and mushrooming slums. What was planned to be 'a city of the future' by its architect C. A. Doxiadis and named 'Islamabad—the Beautiful' by its residents is turning into another case of urban decay (see also PIDE Policy Viewpoints 2, 12 and 13 and Haque and Nayab, 2020).

1. THE CONTEXT

In 2017, the Supreme Court of Pakistan took suo motu notice of irregular development in Islamabad and directed the government to find a solution for regularizing

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these constructions. Later, Islamabad High Court in its judgment dated 9th July 2018 directed the government to form a commission to review the Islamabad Master Plan. Consequently, a commission was formed in August 2019 to review the master plan and give its recommendations.[1] The question arises, would another master plan revive Islamabad? We contextualize this discussion by delving into the history of the city.

2. ISLAMABAD—THE CAPITAL

Islamabad was made capital of Pakistan in 1960. It was conceptualized as a symbol of unity in an ethnically and geographically divided country, flag bearer of modernity, and the seat of the central government[2]. Through Capital Development Authority (CDA) Ordinance 1960, CDA was created and entrusted with the authority to manage and develop the city under MLR 82. In 1992, the CDA promulgated the Zoning Regulation 1992 and divided Islamabad into five zones. In Zone 1, only CDA could acquire land for development. In Zones 2 and 5, private housing societies could take up development activities. Zone 3 was reserved area. Zone 4 was kept for multiple activities including National Park, agro-farming, educational institutions and research and development.[3]

Box 1.
Constantinos Apostolou Doxiadis (1913-1975)

C. A Doxiadis was a Greek architect/town planner and the lead architect of Islamabad, the new capital of Pakistan. In 1951, he founded the private consultancy firm - Doxiadis Associates - and undertook projects in many developing countries of the world. "A crucial element in Doxiadis's modus operandi was his attempt to shore up business success through the excessive branding and mystification of his personality and work. His theoretical discourse abounded in neologisms and unique technical terms – 'Ekistics', 'ecumenopolis', 'machine', 'shell', 'dynapolis', etc. – which were meant to lend an air of distinctiveness to proposals that often shared more with prevailing architectural fashions than he was ready to admit" (Daechsel 2015). But from all of the projects, he considered Islamabad as his best town planning. Islamabad plan was conceived in 1959 and it took 4 years to complete the plan.

Islamabad was planned as a low-density administrative city. Curiously, a Greek architect C. A. Doxiadis, was hired for the purpose. He operated as a development consultant more than an architect.

2.1. The Grid Iron Pattern of the City

Doxiadis planned Islamabad on a grid-iron pattern. The fundamental grid of 2000 x 2000 meters divides the city into 84 sectors, the other is the 'natural' grid created by ravines flowing through the entire site area.

Each sector has five sub-sectors—four residential and one commercial (Markaz), which is encircled by auto routes with pedestrian networks within the sector[4]. Each of the sector would be low slung and basically comprised of single-family homes on an American suburban model. There was no zoning for the poor. Neither did he plan for a city centre—

[1]This, by no means, is the first attempt at reviewing the master plan. Previously, two commissions were formed without much success in getting approval of the government. The first commission worked from 1986-92, and the second from 2005-08.

[2]Some argue the move was meant to consolidate power, away from the commercial interest of the business community in Karachi—the first capital of Pakistan.

[3]Initially, the Metropolitan Islamabad was divided in three parts: Islamabad; National Park and Rawalpindi. In 1979, Rawalpindi separated away from the Metropolitan.

[4]All sectors were to have a mix of low-income, middle-income and upper-middle-income houses.

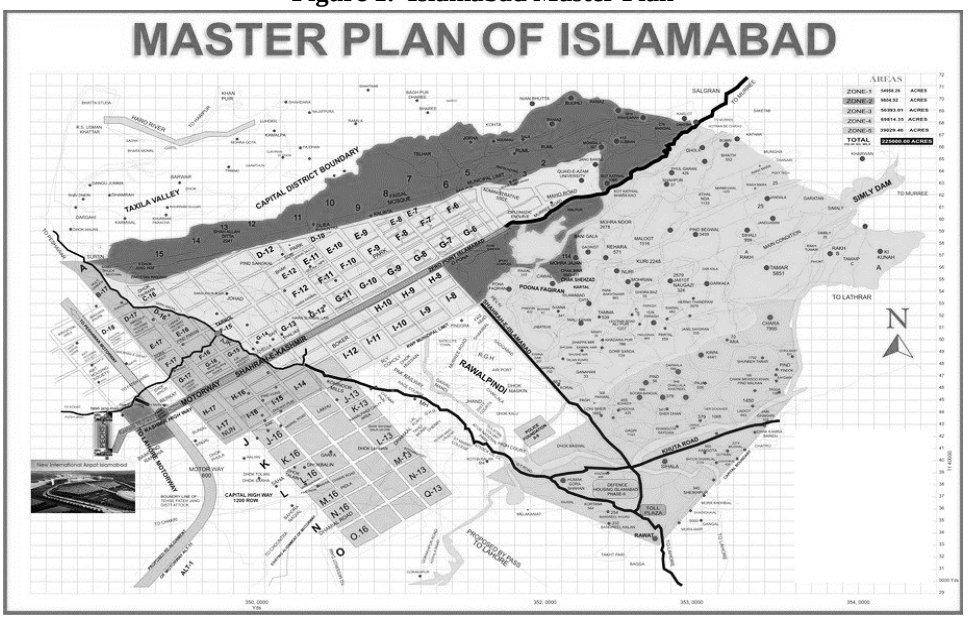
a Commercial Business District (CBD). The only job market he planned for was the government with its secretariat at one end of town. Even the University was out of town and hence cut off from the city housing and labour market.

His concept was quite strange, requiring people to remain confined to their sectors seldom feeling the need to go beyond. Within the sector, they could walk to neighbourhood shops and schools. He also did not plan for extension thinking that the originals setting was enough, and that the capital would demand nothing more than the government.

CDA and the courts have tried to remain true to the Doxiadis' conceptualization, perhaps because they benefit from the expensive suburban setting in the hills. Yet in-migration has happened far faster than envisaged and Islamabad now has more than 2 million inhabitants. Doxiadis' plan has been stretched and tweaked but continues to suffer from its birth defects: no CBD, room for the poor and elongated car dependence.

Oddly enough, a CBD (more popularly known as the Blue Area) was attached to the masterplan to have 8-12 story linearly placed mixed-use buildings. However, this idea could not be materialized due to "lack of design expertise of the CDA. To disguise the incompetence, the CDA officials argued that residences on both sides of the commercial area would have their view of the Margalla Hills destroyed" (Mahsud, 2013, italics added). Besides it is difficult to think of a functional CBD with a highway passing through it and requiring a car to move around.

Figure 1. Islamabad Master Plan



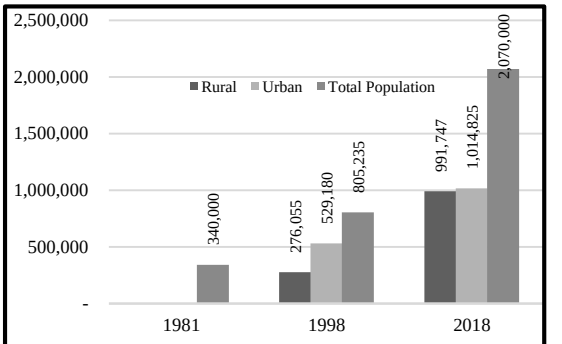
3. DOXIADIS' MESS—ISLAMABAD AND ITS PRESENT CONUNDRUMS

The Islamabad Master Plan, being no exception to master plans elsewhere, has resulted in contrived urban development and stifling of economic activities. The land and building regulations are too rigid and have resulted in over-regulating Islamabad, limiting both social and economic potential of the city.

3.1. Horizontal vs. Vertical Development: The case for Densification against Sprawl

Islamabad has experienced significant urban sprawl owing to unrestricted growth in housing schemes and roads over large expanse of land, with little concern for urban planning.

- At present, the total population of Islamabad is 2 million.
- Housing backlog is about 100,000 units.
- This gap is expected to increase by 25,000 units per year.
- Currently, the supply is about 3000 houses annually.
- The CDA has not launched any new residential sector in the past twenty years. The last sector was launched in 1989 which has not seen any development since then (GoP, 2019).



Box 2: Islamabad Population

Urban Sprawl has its own disadvantages and costs, in terms of increased travel time, transport costs, pollution, destruction of the countryside and arable lands. Reasons for this sprawl are obvious lack of adequate housing, office space, and commerce facilities in the city centre.

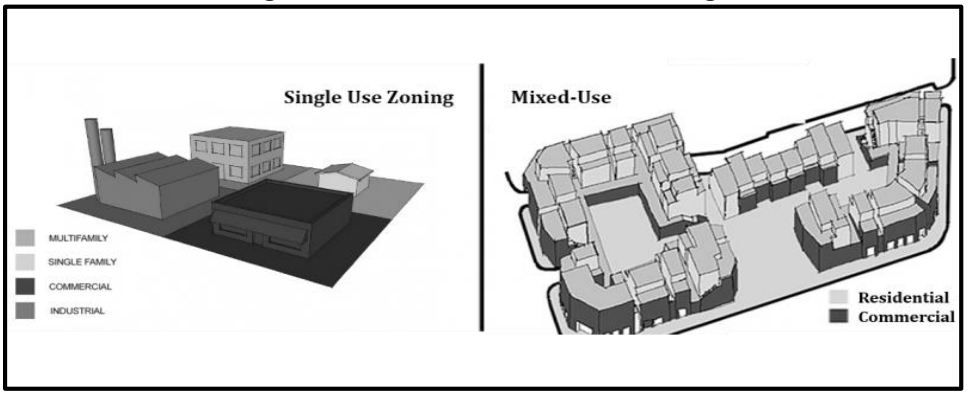
The ordinary citizen does not have any say in the decision-making and planning of their own cities. This raises the pertinent question, are cities made for people or vice versa? Why living in a Pakistani metropolitan is so expensive?

3.2. Restrictive Zoning Laws—A Barrier to Sustainable Urban Development

Part of the problem lies in restrictive zoning[5] in Islamabad that encourages sprawl and single-family homes against high-density mixed-use city centres and residential areas—more in line with the Euclidean zoning which favours single-family residential as the most preferable land use. This leads to inefficient use of land which is a premium asset for any city. Urban regeneration is possible by allowing some flexibility in zoning regulations. The Interim Report on Islamabad Master Plan proposes regeneration of sector G-6 through changes in zoning laws. Incorporating more sectors in this urban renewal will unleash innumerable possibilities for urban development.

[5] Zoning is a planning control tool for regulating the built environment and creating functional real estate markets. It does so by dividing land into sections, permitting land uses on specific sites. It determines the location, size, and use of buildings and decides the density of city blocks (City of New York, 2015). Islamabad had its first zoning regulation in 1992 after the plan recommended by the first commission were not approved. Another amendment in zoning laws came when sub-zoning of Zone IV was approved in 2010.

Figure 2. Euclidean vs. Mixed-Use Zoning[6]



Box 3. In New York City, there are three zoning districts: residential, commercial, and manufacturing. Each of these districts is then further broken down to a range of low, medium, and high-density residential, commercial, and manufacturing districts. Zoning overlays are special purpose zoning districts that are designed to stimulate a particular set of site conditions and outcomes. They are tailored to the specific needs of certain neighbourhoods. For example, a commercial overlay may be allowed on a residential block to provide retail on the ground floor of neighbourhood homes.

4. RECOMMENDATIONS OF THE FEDERAL COMMISSION FOR REVIEW OF ISLAMABAD MASTER PLAN (2019)

The commission was tasked to comprehensively review the Islamabad Master Plan and submit its report.

Box 4. A Federal Commission was formed on third August 2019 for the comprehensive review of the IMP and submit its report accordingly. Given the paucity of time and resources, the commission put forth an interim report that outlined issues faced by the city, gave broad outlines to deal with these issues, and a suggestion to engage consultants for future studies. In short, after about sixty years since the first plan was made for Islamabad, the city is awaiting a plan that will solve its current problems.

(1) Amendments in building bylaws to encourage high-rise buildings in Blue Area, Mauve Area, Class III shopping centres and I&T centre.
(2) Vertical development in zone 2 and 5 to restrict sprawl.
(3) A ring road around Islamabad for better connectivity with other cities.
(4) Widening of existing roads to cater to ever increasing traffic flow.
(5) Mechanism for regularisation of illegal and unapproved housing schemes.
(6) Municipal tax to be collected from residents and businesses for rehabilitation of roads, sewerage line, waste collection and disposal, water supply, rainwater harvesting, and other public utilities and amenities.
(7) Construction of three more mass transit lines to improve connectivity of markaz with regional markets.

[6] http://cnucalifornia.org/straight-line-radius-v-shortest-path-analysis-finding-right-tool-zoning-code/

(8) Conversion of designated parking lots in Blue Area into multi story parking areas on BPT/PPP basis.

(9) Regeneration of G6 sector.

The ghost of Doxiadis and our own flawed urban thinking continues unabated. The recommendations of the commission continue to look after cars, and to restrict the development of high-rise while hanging on the suburban model. They appear to be oblivious to the needs of the homeless and the needs of the growing metropolis of 2 million people.

Box 5. Shortage of Needed City Space

The planning paradigm of Pakistani cities is:

- Low rise (4-floor commercial areas) along wide roads
- Single-family houses and
- A priority to cars: very-widening roads with flyovers and high-speed lanes.

The result has been that the Single-Family home has become the unit for the economic activity taking on all activities such as:

- Schools
- Offices
- Leisure space
- Restaurants
- Shops
- Warehouses

Hence, it can be concluded that masterplans for cities within Pakistan have failed to recognize the variety of human needs or the growing population in cities. Instead, the preferred approach has been to force people into tight fantasies of planning divorced from emerging needs, technologies, or changing lifestyles. The result is that neighbourhoods and needs wage a constant battle against the poor planning standards that are set up.

Courts have jumped into the game without any idea of what the sociology or economy of a city is. A developing country like Pakistan is, therefore, wasting real resources with businesses and livelihoods being destroyed and transaction costs inordinately rising as courts and planners try to enforce unrealistic and fantastic standards. This thoughtless planning is detrimental to economic growth.

5. MASTER PLANS ARE A RELIC FROM THE PAST

All our cities spend resources and time developing masterplans to lock themselves and their cities into a predetermined path of growth and lifestyles. When life does not adjust to these preordained plans for their life, cities and their residents end up in years of strife with encroachments happening involving lawsuits and law enforcement. Cities try to grow and modernise but planners go to the extent of destroying buildings with court injunctions only because they are a couple of feet taller or longer than allowed by stringent regulations.

Yet the push for master-planning continues across Pakistan hoping to keep cities frozen for long periods of time from 15-30 years.

Having seen a boom after the second world war, master plans are increasingly seen as a thing of the past. Reasons for this disillusionment are many:

- Master plans are forward-looking, laying the building foundations of a city for the coming twenty years. However, they rely on the present as well as past data to project future demand for infrastructure and public utilities. Little do the planners realize that these projections are often faulty.
- In Pakistan, master-planning seems to be an inside job between planners and builders who know them. Public participation in the planning process is often perfunctory or nonexistent. These plans, therefore, are never owned by the community nor do planners recognize the needs of the people.
- Master plans are often based on unrealistic assumptions about proposed economic potential of the area as well as the requirements of the population.

- Master plans are static in nature, made at one point in time by select few which makes them irrelevant fast and it's the city dwellers who end up having to face all the ills of that planning.
- There is little flexibility built in to evolve the plan and move the city forward. They are often not updated on time, leaving room for vested interests to intervene and change rules in their favour.
- Master plans seem to dictate how markets should develop leaving no room for them to find their own level. It is thanks to master planning that we see shortage in several areas in our cities.

Cities are Markets

As Haque (2015, 2017) and Framework of Economic Growth argue cities are markets that facilitate economic growth, they must be allowed to grow. Markets create order, which manifests itself in the form of cities, based on price signals. When government intervenes to distort these signals through regulation, that order is also distorted (Bertaud, 2018). Jacobs (1969, 1984), Florida (2012) and Glasser (2011) among others have suggested that cities have multiple needs for them to achieve their central role of driving innovation and creativity. As cities adopt to changing socioeconomics, technology, innovation and talent, none of these are foreseeable to the makers of long-term masterplans. Cities that drive productivity and growth are neither neatly planned nor laid out for suburban living and cars. It is the seeming chaotic nature of these cities that drives their productivity and growth.

For this reason, many cities are moving away from master plans to guidelines and rules that allow the needs of the market and investors to determine what should be built. The city planner only worries about social and community needs, public health and safety and other common issues but not with regulating everything in the city. Directed by needs, investors build flats, shopping malls warehouses, entertainment facilities etc. Plans then worry about the working of the city i.e., guidelines for safety and mobility, infrastructure and social, community and public space. A single mind (of a planner) cannot comprehend the complexities of social interactions among thousands of people.

Developing City Wealth

PIDE Policy Viewpoint 13 and Haque (2020) have pointed to how a modern city finances itself through proactive value creation which benefits citizens' real estate wealth. If city administration adopts this approach rather than rigid master-planning and allows value creation for the benefit of cities, welfare will increase.

Cities often sit on a gold mine of assets that include not just real estate and public utilities but can also create wealth through socioeconomic uplift of its people and regeneration of decaying urban areas. These assets can be materialized through better city management (Detter and Fölster, 2017). Singapore, for example, has built its economic and human capital through this approach (*ibid*). When this approach is adopted, cities seek to regenerate their neighbourhoods in line with market needs. Such regeneration plans are in vogue these days and require market friendly thoughtful city planning.

Summing-up

- The World has moved on from restrictive master planning. Master plans are time and data intensive. They rely on present data to make future projections which are often faulty. Being Static and mostly non-inclusive, they become irrelevant fast and leave ample room for manoeuvring by vested interests. Their stringent requirements leave little space for markets to develop.
- Islamabad Master Plan (IMP) was a flawed exercise from the very start and failing to revise it every 20 years has increased the damage IMP is doing for the inhabitants of Islamabad.
- Newer methods like neighbourhood planning is used across the world and we should also employ them. Many new tools are developed which were not developed when IMP was made. Every year, the population of Islamabad is growing, although it was thought that people will come to Islamabad, serve the government, and then leave the city and new government servants will take their positions. It is clearly not happening as the population has risen to two million. With current rate of development, it would be impossible to sustain Islamabad as a city.
- Islamabad is an over-regulated city. City zoning has been very restrictive, favouring single-family houses with little scope for commercial and civic activities. Successful cities have regulations and zoning codes that are flexible to adjust to changing physical requirement of a city.
- Islamabad is not an affordable city for low-income groups to reside in. Real estate prices go up where height restrictions are excessive and building process is discouraging of construction. Rezoning helps development and increase of supply land to keep prices in check.
- As IMP is in the process of being re-evaluated, we suggest a complete paradigm shift in our approach to city management – a shift that should be applied to other cities in Pakistan.

New Paradigm for City Management

- Policy, research and thinking needs to move away from a spaceless approach to development by integrating the role of cities as engines of growth.
- Fiscal federalism needs to be urgently adopted for city growth and to allow cities adequate ownership of their land and resources.
- The zoning paradigm needs to move away from its current emphasis on upper class housing to one that recognizes the diversity of the functions of a city. It must favour density, high rise mixed use and walkability especially in downtown areas. In addition, it must favour public and community space while allowing for commerce, culture and education and other needed city activities. Zoning needs to be based on clear transparent processes based on open citizen consultations.[7]
- Building regulations must be loosened to allow complex high-rise construction.
- City centres need to be developed for dense mixed use. Government ownership of city-centre land needs to be reduced if it is retarding downtown development. Commerce is to be given priority in city centres.

[7] See also Hasan (1997) for this point.

- City management should be professional, consultative and accountable. Cities must be able to hire out of their budgets without federal hiring restrictions such as the Unified/National Pay Scales and mandatory positions for the federal civil service. Moreover, decision-making must be based on open consultative processes.

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Strategies to Improve Revenue Generation for Islamabad Metropolitan Corporation

LUBNA HASSAN

Like most Pakistani cities, Islamabad has a fragmented administration, weakening its revenue base and service delivery.

This duality of structure was introduced through the Islamabad Capital Territory Local Government Act 2015, which led to creation of Metropolitan Corporation Islamabad (MCI) for the city's governance, in line with the city management practiced around the world.[1] The fragmented administrative resulted in an MCI that is dependent on CDA and Federal Government for its finance.

Box 1. Budgetary Issues

Given the administrative relationship, there is little clarity in services as well as budgets. Some key points to note:

- CDA considers itself a developer as well as a regulator. It earns through auctioning developed plots for construction. It does seek infrastructure finance from the federal government through the PSDP specially to build roads and flyovers. In 2017-18 CDA's total expenditures were Rs 34 billion while its revenues are about Rs 23.7: the shortfall is financed by the GDP
- MCI earns only through some property tax and user fees. It continues to have a has a large budget deficit which GOP finances through CDA.
- Salaries remain high in both departments owing to the legacy factors. In 2017-18 the salaries of the CDA and MCI (Rs 10 billion) accounted for about 83% of CDA revenue.

1. THE DUALITY OF ADMINISTRATIVE STRUCTURE

The responsibility for the planning, development and maintenance of the Master Plan for Islamabad stayed with CDA.[2] while MCI was delegated the responsibility for managing and providing municipal services and infrastructure, regulating markets and promoting cultural, social and economic development activities.

The most productive tax base remained with CDA while the expenditure accruing public services became the responsibility of MCI.[3]

This duality in the administrative structure of the city means that MCI, which has the mandate of city administration, is likely to remain in deficit and dependent on financing from either the CDA or the Government of Pakistan (GOP).

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[1] See Framework for Economic Growth (2020) which did recommend this approach.

[2] According to the rules set out in the CDA Ordinance 1960 and the ICT Zoning Regulations 1992. This largely includes land management, state development and building control and regulation.

[3] The primary revenue streams for the city, however, remained sale of commercial and residential land, building control and regulation fee and licensing with little effort to expand revenue streams and develop new.

It will be hard to plan services or to maintain a level of quality service in the city. As the functions and responsibilities of the local government evolve, it is important to consider the financial resources available to provide the increasing number of responsibilities being allocated to local government.[4]

It would be wise to consider eliminating this fragmentation as a part of the plan to put Islamabad on a sustainable financial plan**.**

2. CURRENT REVENUE STREAMS OF MCI

MCI has limited sources to earn its revenue from (see Box 2). It has revised some of the tax rates in Islamabad. It collects its revenue through two departments (see Box 3)

Table 2

Detail of Receipts of DMA (2017-18)

Head	Amount (Rs)
License Fee	329,356,945
Sign Boards/Banners	78,902,797
Open Spaces Rent	57,954,762
Telecom Unit	47,534,722
Weekly Bazaars	21,991,442
Trade Licensee	8,909,750
Birth & Death Certificates	1,884,980
Court Fines	843,900
Rent of Dhobi Ghats	114,150
Coffin Carrier & Graveyard Digging	897,980
Misc.	196,100
Total	548.59 Million

Box 2. Financing Streams for MCI

- Water rate
- Drainage rate
- Conservancy rate
- Fee for approval of building plans
- Fee for change of land use of a land or building
- Fee for licenses, sanctions and permits
- Fee on the slaughter of animals
- Tax on professions, trade, c and employment
- Market fees
- Tax on sale of animals in cattle market
- Toll tax on roads, bridges and ferries maintained by MCI
- Fee at fairs and industrial exhibitions
- Tax for the construction or maintenance of public utility
- Parking fee
- Water conservancy charges
- Tax on installation of base transceiver station/tower
- Any other tax or levy authorized by the government

2.1. Analysis of Revised Tax Rates

MCI has revised some of the tax rates in Islamabad. The revised tax rates as of 1st July 2019 is estimated to considerably increase the revenue of MCI.

(a) The rates of property tax rates have been revised upward and the estimate for increased revenue is about an additional Rs 1 billion.

However, several issues that need to be addressed in moving to a tax system that is more in line with market forces. Some considerations are:

Box 3.

MCI collects its revenues through; 1. Revenue Department and, 2. Directorate of Municipal Administration (DMA)

The Revenue Department collects taxes from three sources; (1) property tax, (2) water charges, and (3) conservancy charges These taxes are levied on the basis of covered area multiplied by the established rate of land based on its usage, for instance residential, commercial, industrial, government institutions etc.

Revenue Department collections for the year 2017-18 are:

- Property tax: Rs 860 million
- Water and conservancy charges: Rs 250 million
- Total revenue: Rs 1,110 million

[4] In addition, while CDA under the 1960 Ordinance was responsible for only a select number of sectors, the Local Government Act 2015 has expanded the region under the jurisdiction of MCI. This has led to a number of new rural areas being included in the administrative boundaries of MCI where MCI is now responsible for all planning and development of land, infrastructure and public services, increasing the burden on its limited pool of resources.

- The levies are not related to market valuations but purely on basis of square footage of land and covered area.
- Location too does not seem to matter in this calculation although valuation and use of property clearly depends on location.
- Similarly, the differences been residential and commercial are also not reflective of market conditions.

Given that Islamabad real estate, both in valuation and rentals, is the most expensive in the country and among the most valuable in the world, the expected revenue of Rs. 2 billion does suggest that there is room for improvement.

(a) The revenue department also plans to install meters to estimate water consumption by companies and levy taxes accordingly- a welcome step in a water-short country.

3. DEVELOPING A REVENUE PLAN FOR ISLAMABAD

MCI is a new entity established through the recent Local Government Act. It is wise to develop such a strategy around budget and financing issues. Islamabad's finances as well as public service provision will improve substantially if the consolidation and rationalisation of the budget, the agencies and public service delivery were carefully evaluated.

3.1. Property Taxes

MCI has taken steps to revise the property tax system that is more in sync with the market-based rates. Scope for improvement in property taxation is huge as currently less than 10% of MCI/CDA revenue comes from this source.

Some important points for this are as follows:

(a) Property taxes must be related to market valuations which will vary by location,
(b) Use - e.g. residential, commercial, community, etc.
(c) Possible economic gains such as rent and capital gains
(d) When fixing rates due consideration should be given to incomes and ability of people to sustain the increase.
(e) City administration should try to establish a real estate market which is transparent in its inventory for sale, the transactions as they take place and the swift exchange of property. This will help increase valuations and the revenue collected in Islamabad.
(f) According to census, the number of pucca houses in Islamabad is about 1.1 million units. Assuming that the average value is Rs 1 million, the valuation of the real estate stock would be about Rs 1 trillion. Setting property taxes at .5 percent of value, the estimated tax revenue is around Rs 5 billion.
(g) We have no estimates for commercial real estate. Currently we can assume that it can be no less than residential real estate.

3.2. Utility Fees

Currently, utility fees are charged on a system that is a derivative of the current system for property tax. Designing a system based on proper metering and charging on the basis of actual use would increase the yield. Assuming metering will give utility yield of about .05 percent of value, the potential revenue from metering should be about Rs 1 billion.

3.3. User Fees

Revenue generation from user fees is an area where considerable progress can be made in Islamabad. Currently, cars, cattle, bazar fees, tolls and other licenses including telephone towers, constitute only about Rs. 200 million, which is equivalent to about 1% of the CDA/MCI budget.

Box 4.

1. Street Parking: Designated spots on streets. No parking beyond these spots.
    a. If 50,000 such spots at Rs. 100 an hour between 7am-10PM 6 days a week
    b. 50% occupancy
    c. Revenue =Rs 11.7 billion
2. Parking lots: 10 in city with 20,000 capacity total at 1000 a day
    a. With 50% occupancy
    b. Revenue: 3.6 Billion
3. Fast Track: Fast lanes during rush and other areas to alleviate congestion and rationalize traffic. % arteries in Islamabad average of 100 Rs affecting 20,000 cars a day. Revenue 7.3 billion.

3.3.1. *Possible Revenue from Cars*

Car parking can generate considerable resources for MCI. Efficient solutions for collecting revenues can be developed using cameras and mobile technology without the need for outsourcing it.

(a) The design of parking policy begins with clearly designated parking spots for street parking and a clear policy that parking beyond designated spots is not allowed. The principle is that streets are public property and car-owners are renting it for a particular period of time.

(b) If the cost and supply of street parking is clearly defined, parking lots can generate high amount of revenue. Even at a non-trivial tax rate, Rs. 20 billion can be generated from parking spaces alone.

(c) Islamabad has engaged in the old school approach of addressing congestion and traffic control through the expansion of roads, and construction of underpasses, overpasses and bypasses at considerable cost. World over. the most important form of traffic control is paid parking in cities that rationalizes use of private vehicles through high costs.

(d) One alternative that the world uses is *Fastrack*; paid fast lanes for users who need to travel fast and reach their destination in shorter time. These lanes clear congestion while also creating an opportunity to earn revenue for the local government.

(e) Apart from parking spaces, higher revenue can also be generated by renting out open spaces. MCI can earn almost Rs. 1 billion through better utilization of assets (Box 5).

Box 5. Possible Revenue from Small Street Commerce

An inclusive approach to city development is to allow street commerce for poor entrepreneurs. Even mature cities like New York, London, Singapore, DC and Paris allow a large amount of street commerce. Not only is this a revenue item, it also makes for better city living and a more cohesive and inclusive community. If Islamabad allowed this through licensing a well-organized street kiosk system throughout the city, it could generate substantial revenues. If there were an estimated 30,000 kiosks renting out space at a daily rate of Rs. 100, the annual revenue would be about 1 billion rupees. In addition, the employment, social and economic benefits will be huge while creating an attraction for the city's diplomatic community.

3.4. Asset Ownership and Management

The city of Islamabad owns a number of assets that could be better utilised to generate revenues through renting out these public spaces to private sector.

Table 3

Proposed Asset Utilisation

Asset	Daily Use	Revenue
Jinnah Convention Centre	100,000	30,000,000
Jinnah Sports Stadium	100,000	30,000,000
China Centre	50,000	15,000,000
Shakaparian	20,000	6,000,000
Monal and Neighbouring Areas	20,000	6,000,000
Zoo	30,000	9,000,000
PNCA	20,000	6,000,000
Total	340,000	102,000,000

Although the city has developed assets over time, but it has done so without a clear focus on utilizing the assets for maximum yield. An inventory should be taken of all assets in the city, followed by systematic efforts to improve their management.

3.5. Increasing Value Through Urban Regeneration

(a) The market value of land in Islamabad has increased rapidly.

(b) The city faces acute shortage of shopping areas, schools, offices, commercial buildings, ware-houses, entertainment, hotels, as well as housing.

(c) The zoning laws of Islamabad have restricted growth in commercial activity and discouraged the development of affordable housing schemes by restricting high rise buildings and mixed use of land.

(d) The zoning regulations need to. be reviewed on an urgent basis.as they are holding back city's development and hence, the ability to levy tax.

Box 6.

Building Regulations of CDA restrict the development of High-Rise buildings. This has not only increased real estate values significantly for the common man but also eliminated an important source of revenue for the local government. Allowing for the development of apartments in High-Rise buildings and formalizing the regulations for transfer of apartment ownership can be an important source of revenue for the local government as well as provide affordable housing for the low- and middle-income families.

Restrictive zoning is driving residents out into suburbs in search of affordable housing, causing the city boundaries to expand while burdening the capacity and resources of local government. The inflexible zoning laws that have not been updated with the changing needs of the city have restricted growth in productivity and potential revenue streams for the local government.

Box 7. Efficient Use of Land

The amount of revenue that a piece of land can generate is contingent upon its efficient use and allocation. A prime example of it is the provided by the contrast between the revenue being generated by the Centaurus mall versus the Blue Area. The commercial hub in the centre of the city, known as Blue Area, is estimated to generate a total of Rs 79 million annually through property, water & conservancy charges. In contrast, the three towers of Centaurus mall occupying a much smaller land area is generating Rs 15 million from advertisement, Rs 18 million from property, water & conservancy charges, and Rs 5.6 million annually from 700 apartments. This equates to a total of 38.6 million being generated from the mall of Centaurus alone. The difference between the revenues in line with occupied land area highlight how a strategically planned commercial use of land can generate much higher revenue. Centaurus mall is generating half as much revenue as Blue Area but occupying a much smaller area in comparison to Blue Area.

Rezoning could increase value and the tax base of MCI. Some examples are:

- Blue Area which is a planned linear hub of commercial activity in the city could be rezoned as a broader commercial area through multi-purpose modern high-rise building structures that increase economic activity while also expanding the revenue base for MCI.
- Allowing older single-family home structures to convert into multi-family apartment structures could increase availability of much needed housing space as well as the revenue base for the city.
- Renew the sectoral markets which use large tracts of land for a suburban village and do not provide the space for city department stores and warehouses.
- Allow more mixed used walkable space in high-rise neighbourhoods.
- Make flats the unit of living in most areas of the city.
- Allow more neighbourhood commercial activity (offices, shops, entertainment etc) to develop to alleviate congestion and allow value to develop more evenly.
- The area around Metro stops should be facilitated and rezoned to allow them to transform into high value areas for mixed-use development. This will have many benefits including higher revenues and investment for Islamabad.

3.6. Public-private Partnership (PPP) for Creating Asset and Managing Assets

(a) MCI has the legal option to enter into a PPP and could be used for enhancing revenue. A PPP framework should allow the cost and user fee to be split between public and private partner.
(b) MCI has eight to ten dispensaries under its ownership which can be turned into diagnostic centres through private sector partnership.
(c) MCI also has an allocated land for educational institute which can be turned into a vocational training institute in partnership with the private sector.
(d) The private sector has the potential and capacity to create and manage assets that will yield revenue going forward. Possibilities are numerous; (1) Chairlift to Monal and beyond, (2) Islamabad eye—a Ferris wheel, (3) Developing more ridge entertainment like Monal

3.7. Promoting Tourism

(a) Charge entry fees from tourist attractions such as museums, historical buildings.
(b) Promote tourism by attracting international tourists to existing locations such as Lok Virsa, Monument, Margalla Hills, Shakarparian and Saidpur Village.
(c) Start a city bus service to provide a tour of all the sites in the city.
(d) Establish Cable Car service from Zero Point to Monal Restaurant.
(e) A higher number of luxury hotels can also generate a lot of revenue for the local government through property tax, water and conservancy charges and bed tax.
(f) Established an Expo Centre for foreign investors to visit and explore Pakistani products.
(g) The revenue model provided here is based on a win-win strategy, where investment, employment, commerce and other economic activities will improve sharply. If Pakistan

adopts city based local governments, this approach to managing cities should be studied for all cities.[5]

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[5]See also https://www.researchgate.net/publication/325755941_Looking_Back_How_Pakistan_ became_ an_Asian_ Tiger_in_2050

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Getting More Out of the PSDP through Results Based Management

RAJA RAFIULLAH

Since the first Five Year Plan, Pakistan's development policy has been modelled around the development philosophy of Dr. Mahboob Ul Haq and the Harvard Advisory Group (HAQ/HAG). As a result, the key features of the country's policy over the past six decades, as summarised by Haque (2020),[1] have revolved around:

(1) A focus on building physical infrastructure through discrete projects of sectors in the economy, with infrastructure having a share of about 80 percent in the PSDP.
(2) Planning to develop medium term budget to finance sectoral hardware.
(3) Seeking foreign aid to meet financing gap in the plan given an expected shortfall in domestic savings.

This approach has led to:

(1) An excessive focus on "brick and mortar" development.
(2) Fragmented projects as Planning Commission was weakened by repeated BoP crises and resorting to IMF programmes.
(3) Weakening standards on project development implementation and cost – due to increased politicisation.

Is PSDP Process Obsolete?

Public Sector Development Programme (PSDP) which has been the mainstay of Pakistan's fiscal policy has never been reviewed, updated or evaluated. Haque, et al.[2] show that the PSDP process leads to a lot of waste:

(1) Evidence from econometric research[3] on Pakistan indicates that public investment has not significantly driven economic growth or private investment despite persistent attempts to use PSDP's public investment as an instrument to generate economic growth. PSDP may have been a useful tool in the early days of its formulation, but in a changed milieu the return on PSDP is very low now.

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[1] PIDE Policy Viewpoint No. 11, 2020.

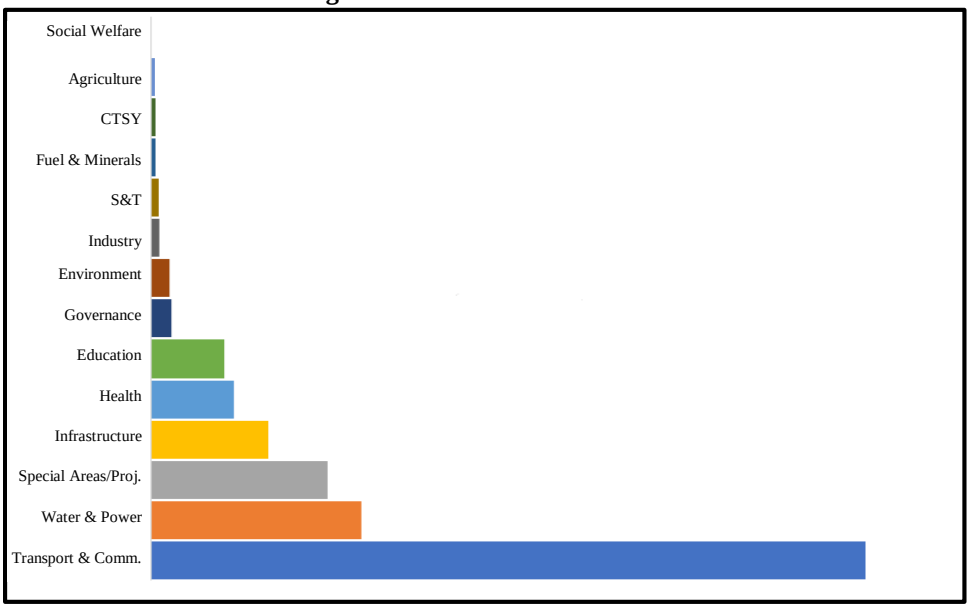
[2] Haque, Mukhtar, Ishtiaq and Gray, *Doing Development Better*, PIDE, 2020.

[3] See PIDE Policy Viewpoint No. 11, 2020, for a list of econometric studies and their findings.

(2) Public Sector Development Programme (PSDP) has had an excessive focus on using public investment to build physical infrastructure.

The emphasis is on "brick and mortar" in our projects. PSDP has developed roads, buildings for education, sport, and entertainment but without managing them for a return. The sectoral share of PSDP from 2018 shows that we are yet to deviate from the 'brick & mortar' policies. (see Figure 1)

Fig. 1. Sectoral Share of PSDP[4]



(1) PSDP is heavily politicised. MNAs push and pull in their constituencies which leads to waste. Bureaucracy too builds offices, training academies that have huge excess capacity.
(2) Leaders waste money by using PSDP to spend on favourite projects which may not be the best or the most required.
(3) There was a good PSDP process based on a mandatory cost-benefit analysis and several in-depth reviews, but no one wants to subject themselves to that disciplines. Instead everyone uses executive authority to bypass the system.
(4) R&D and capacity building are not part of the PSDP despite being modern drivers of growth.
(5) Government departments have an incentive to propose projects without a clear business plan on how to later operate them to maximise returns.
(6) The emphasis on building has led to a neglect of human resource management leading to continual brain drain and declining government productivity.
(7) Projects are poorly managed leading to cost and time overruns. These have huge implications for realised returns of the projects.

[4] Haque, Mukhtar, Ishtiaq and Gray, *Doing Development Better*, PIDE, 2020.

The World Has Gone Beyond Brick & Mortar

Haq/HAG model was developed at a time of extreme infrastructure shortage and when globalisation had not happened. It naturally focused on "brick and mortar" as well as searching for aid. In addition, it merely looks at expenditures and not results. There was an evaluation process envisaged in the Planning Commission's system (PC-IV and PC-V), but it has long ago fallen into disuse. For Pakistan to achieve rapid and sustained economic growth a rethink of our development policy and its implementation mechanisms is required.

Box 1. Beyond Brick and Mortar

- Invest on capacity building of people
- Open the economy to international trade and investment.
- Deregulate to increase ease of doing business.
- Use only nuanced government intervention to correct market failures: Do not distort markets unnecessarily.
- Build inclusive institutions.
- Invest in local universities and think-tanks.
- Facilitate synergies between academia and markets to increase innovation.

Other countries both in the developing and the now-developed world have successfully broken the cycle of underdevelopment and achieved sustained rapid economic growth.[5] These countries despite being diverse in geography and culture, have invested in human development. Infrastructure on its own is not enough unless it is accompanied by human capital that can utilise it efficiently. Furthermore, to go along with the capacity building of its population, these countries opened their economies to international trade and competition leading to growth of private enterprise. The private enterprise in turn led to an increase in innovation and knowledge creation which are integral ingredients of sustained rapid economic growth.[6]

There is another important piece of the jigsaw that needs to fall in place before a country can be on the road to economic growth. That is the role its institutions and in particular public institutions play in fostering inclusive environments that lead to competitive markets, innovation and ease of doing business.

Unfortunately, Pakistan historically has had extractive institutions due to its colonial legacy and these institutions instead of creating a vibrant regulatory, social and physical space for innovation have only worked to serve the purpose of the local elites.[7] Furthermore, these institutions have through excessive regulation and/or unnecessary subsidies distorted market and crowded out private investment that could have potentially led to innovation across multiple sectors.

Policies' Implementation: Building a Performance Based System

Re-orienting sectoral focus is important, but an effective system will only evolve if mechanisms that track, monitor and evaluate it are put in place. Moving away from the philosophy of Haq/HAG model that focused on expenditure on inputs only, Pakistan needs to move towards a performance-based system. The Prime Minister himself has shared his desire to have such a system in place and its time we move towards implementing one.

[5] Acemoglu and Robinson, *Why Nations Fail*, 2013, pg. 468.
[6] *Framework for Economic Growth*, PIDE, 2020, pg. 36.
[7] Haque, N. *Looking Back: How Pakistan Became an Asian Tiger By 2050*, 2017, pg. 92-111.

The Planning Commission's Framework for Economic Growth (FEG),[8] approved by the National Economic Council (NEC), proposed a performance-based system using Results Based Management (RBM) principles back in 2011. Unfortunately, the recommendations of this framework remain to be adopted.

The system that is proposed in FEG constitutes of the following steps:

- Each year the Planning Commission should coordinate with the Finance Ministry/ Department and articulate the Medium-Term Budgetary Framework (MTBF) within the overall macroeconomic situation. This MTBF should lay the foundation for allocation of 3-year rolling indicative budget ceilings.[9]
- Planning Commission should in this system cooperate with the in-line ministries/ departments in developing performance contracts for approval by the Cabinet. Once the contracts are approved, the Planning Commission should be the monitoring body reporting to the Cabinet.
- The Planning Commission should work with a 'Public Financial Management' team from Finance Ministry/Department and develop accounting systems capable of recording and reporting actual expenditures based on outputs and outcomes.[10]

Box 2.
FEG Proposed RBM Framework will facilitate:

- Periodic identification of emerging constraints to economic growth through research and dialogue with all sectors and stakeholders.
- Objectives, outputs & outcomes clearly defined in an overall development & growth strategy.
- Systematic measuring of productivity and public service delivery through M&E system.
- Fiscal allocations for projects based on outputs & outcomes.
- Development and review of quantifiable plans regularly.

Decentralisation: NFC Award & 18th Amendment

Ever since the 18th Amendment major subjects such as health and education among others have been devolved to the provinces. In due course, at provincial level provinces should develop their own Medium-Term Budgetary Frameworks (MTBFs) in addition to their own Result Based Management and Evaluation mechanisms. The role of the Planning Commission should be strategically critical in coordinating with provincial planning and development departments, and also the finance departments to ensure that necessary processes are in place to enhance "planning, budgeting and monitoring within departments of the provincial governments".[11]

The Future is Policy and Reform

Acemoglu and Robinson (2013) have summarised global evidence to point out that the path to sustainable growth acceleration lies in reform and policy. This important message also suggests that our growth policy must no longer rely on the Haq/HAG model.

[8] See *Framework for Economic Growth*, PIDE, 2020. It should be noted that the original role of the 5-year plan too was that of a medium-term budget that was growth oriented. The annual budget was then aligned to the MTBF. Both MOF and IMF found that discipline to be incompatible with short term adjustment especially as such adjustment would require deep structural reform.

[9] *Framework for Economic Growth*, PIDE, 2020, pg. 133.

[10] Ibid., pg. 134.

[11] Ibid., pg. 134. For more details on how to implement the RBM see Haque, et al. 2020. *Framework for Economic Growth.*

To do this with a small amount of investment, the Planning Commission must seek deregulation and market building mechanisms. Instead of brick and mortar, challenge grants could be an important source for change. Some examples of these could be:

(1) **Challenge grant funds** for deregulation of the real estate sector in cities in line with Prime Minister's vision based on number of tower cranes on the ground in city centers or number of apartments commissioned in city centers.

(2) **Market development grants** to cities, provinces and markets based on clear targets of number of transactions in a quarter. Examples of this could be:

   (a) To enable cities to develop electronic platforms for real estate titling and transactions.
   (b) To develop commodities markets with storage in various small agri-based towns.
   (c) To allow the SECP to develop a market development plan that seeks to broaden and deepen the market. The making of this plan could be a PC-II and then the reform plan if funding is required can be a PSDP loan.

(3) **Health sector productivity grants** are needed but it should be kept in mind that health is a provincial and local subject after the 18th Amendment. The Planning Commission can have matching grants for credible, implementable and monitor-able plans submitted by local health systems that need improvement. This will combine central injection of funds to the decentralised funding streams that are trying to tackle the issues at a local level.

(4) **Education grants can be commissioned** but new campuses' development should be halted and existing universities and schools that have developed some online capability should be asked to present common programs for quality online teaching capability that Planning Commission in collaboration with HEC should support. Making these programs monitorable will be the key. Some indicators that can be used to track these programs could be capacity utilisation, peer-reviewed course content creation, student satisfaction surveys and professional body reviews among others.

(5) **Kick starting the knowledge economy** is very important. For too long the buzz word "knowledge economy" has been used without much clarification. It should be noted that the term and what is represents are of little use unless existing research capabilities are increased. It is time that the Planning Commission developed methods to catalyse some research beyond the HEC. We need to prime our research system to grow and take on its responsibilities. It will take a while, therefore it is paramount that we begin at the earliest. Examples of mechanisms that could be developed for research activity to take off include:

(a) Peer Bodies to Evaluate Proposals for Theme-based Research

The Planning Commission should set up research themes and let a panel of both local and external eminent researchers adjudicate and provide rapid research for policy, markets and industry. The emphasis of this should be to provide research on local problems instead of publications meant for external market consumption.

(b) Planning Commission can Partner with Industry to Fund Critical Research to Their Sectors

With matching funds, the Planning Commission can initiate research on key issues related to sectoral interests. Processes can be identified to make research happen in the country to address burning questions on a fast track basis.

(c) Tax Policy and Administration Reform

Tax Policy and administration reforms should be the first themes that our academia vigorously takes up. This would be an important step towards having wide debate on important subjects that are impeding development. These central topics have long been in hand of external consultants and it is about time that our academia takes them up.

(6) **SME and micro commerce growth** are vital for the country. Planning Commission can use the PSDP to kickstart local commerce by working with Ministry of Commerce and local authorities to develop frameworks for the poorer segments of society. Some examples of such frameworks could be**:**

(d) Street Vending Frameworks for Cities that Lack Them

Putting street vending frameworks in place could provide employment to millions of people. We estimate that with proper framework there could be 50,000 of such enterprises in large cities with a possible employment of about 2 or 3 persons per such enterprise i.e. 100,000 – 150,000 employment opportunities. Cities can be incentivised with a PSDP grant to put in place regulatory frameworks for such enterprises. The number of vendors and frameworks can easily be monitored.

(e) Small Enterprises Coming Out of Crisis

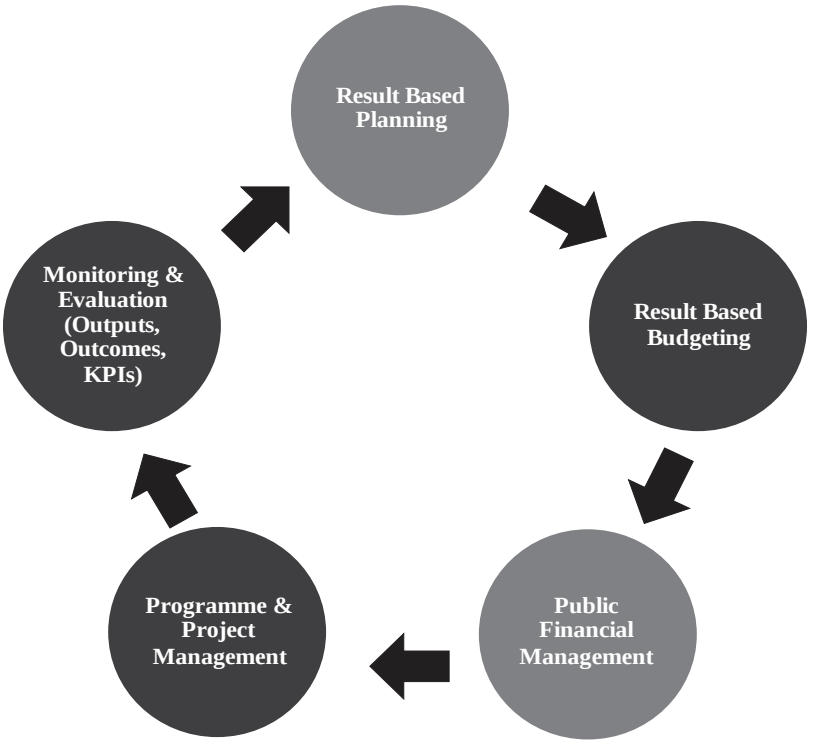
In collaboration with local chambers and universities, frameworks can be developed for supporting SMEs as they come out of a crisis. For example:

(i) **SME loans** be made available through local chambers and SME associations but monitored and evaluated by local universities and schools generating both research and community development.

(ii) **Regulatory burden of SMEs** can be linked with local universities and even high schools to review the regulatory burden and seek changes. The Planning Commission can be a catalyst for change by facilitating these linkages.

Employment insurance and pension development market-based mechanisms can perhaps come into the picture at a later stage when markets have developed and transparency has increased. These could be in the shape of investment schemes in which employees of SMEs could invest with these investments acting as employment insurance. The whole process of the recommended Results Based Management is summarised in Box 3. Each step of this cycle involves different roles from different ministries. These are:

Box 3.
RBM System for Development and Growth in Pakistan



- **Results Based Planning**—An overall growth strategy implemented by ministries and departments—coordinated by the Planning Commission. Overall objectives, baseline statistics and KPIs identified.
- **Results Based Budgeting**—Each year Planning Commission with Finance Ministry allocates fiscal budgets for ministries/departments
- **Public Financial Management**—Planning Commission facilitates funding to specific ministries through liaison with Finance Ministry. Specific ministries formulate their own 'Output/KPIs Based Budgets'. Planning Commission reports actual expenditure on predetermined outputs.

Program & Project Management—Each ministry/department is responsible for implementation of its approved projects and quarterly reporting of outputs achieved and funds spent to Planning Commission.

Monitoring & Evaluation—In addition to ensuring quarterly reporting by each ministry's/department's Principal Accounting Officer, Planning Commission devises M&E systems that measure yearly progress against predetermined outputs for each ministry/ department. Next year's planning & budgetary adjustments are made based on this M&E analysis of outputs & KPIs.

If done right the Planning Commission could utilise relatively small amount of funding to mobilise a large amount of rethinking that is necessary for an increase in productivity. Having said that, this approach will require considerable fresh research and thought for which we should try to mobilise our universities and our local intelligentsia. In doing so, this will also reduce our over-reliance on donors and foreign consultants that has created a policy mess since the early days of Pakistan.[12]

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[12]Markus Daechsel in his 2015 Book '*Islamabad and the Politics of International Development in Pakistan*' expounds upon one such example of how international consultants bring ideas to Pakistan that are often removed from its milieu and hence instead of aiding in development create a conundrum. The story Daechsel tells is of the Greek architect, Constantinos A. Doxiadis, who designed Pakistan's capital city Islamabad. Ironically, he was also the designer of Korangi Pilot Township (for refugees & slum-dwellers) near Karachi and had extensive input in drafting of Pakistan's First Five-Year Development Plan.

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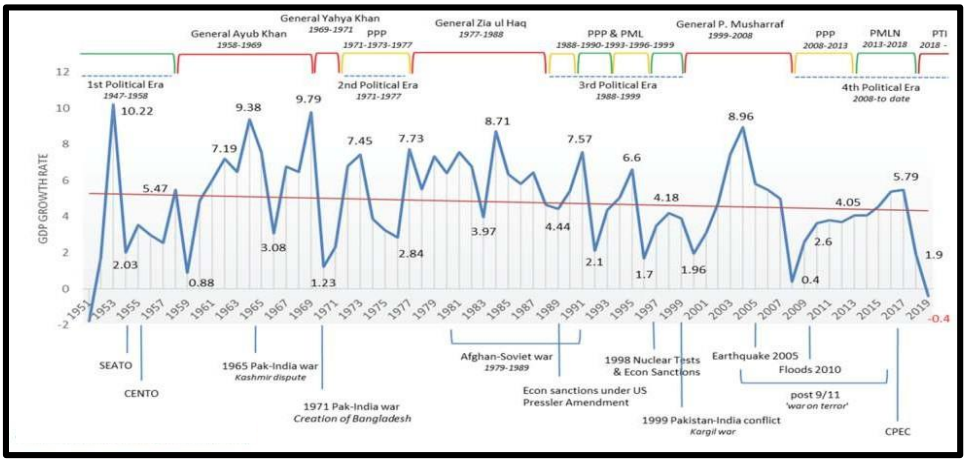
PIDE'S Charter of Economy

NADEEM UL HAQUE and SADDAM HUSSEIN

BACKGROUND

Despite experiencing extreme economic and political instability, Pakistan has still been unable to break with the ramshackle of its unstable development enigma. Pakistan's economic indicators over the last seventy-two years have fluctuated widely: the sixties, the eighties, and a significant part of the 2000s registered high growth episodes (over 6.0 per cent), with low growth observed in other periods. In the last twelve years (2008-20), growth averaged 3.25 per cent annually, crossing 5.0 per cent just twice (see Figure 1) Why so much volatility? Why does the economy rudderless and lacking direction?

Fig. 1. Pakistan Growth Pattern



Source: Faheem Jehangir Khan (2020).

Likewise, the total factor productivity grew at a rate of 1.62 percent during 1972-2019. However, the long-term trend, similar to the trend of GDP growth, exhibits a decline. Investment as a percentage of GDP is also declining, and Pakistan's investment rate is also less than the neighboring countries.

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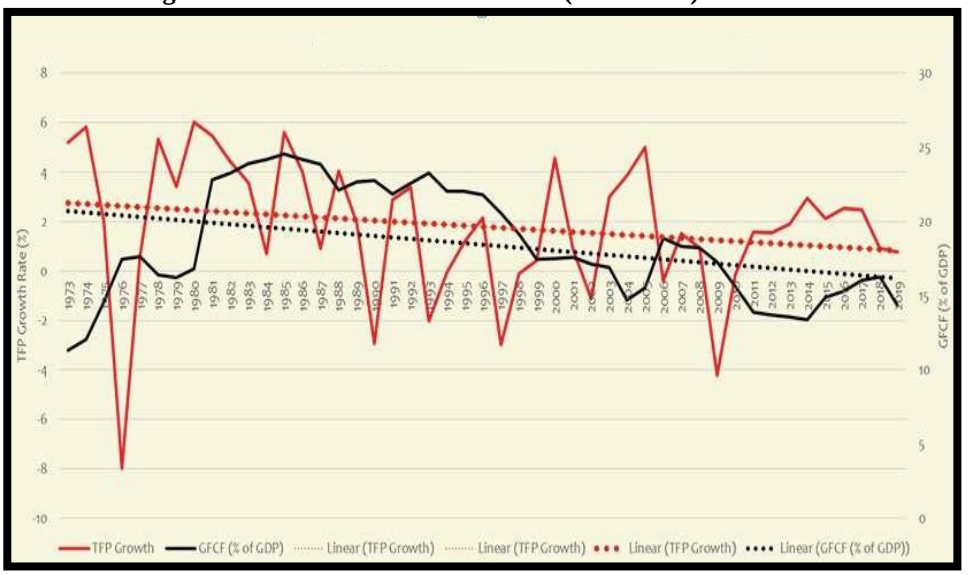
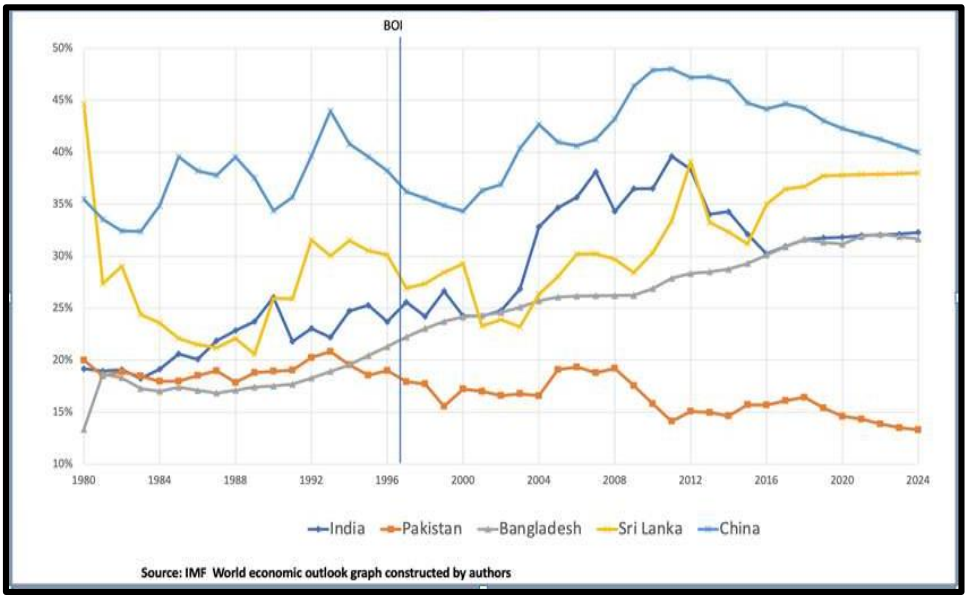
Fig. 2. TFP Growth Rate and GFCF (% of GDP) 1972–2019



Source: PIDE Reform Agenda (2021).

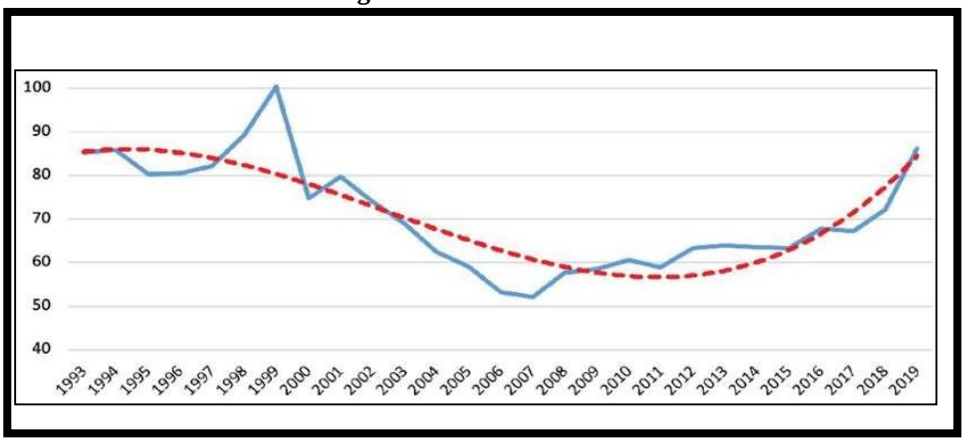
Fig. 3. Pakistan Investment *vis-à-vis* Neighbouring Countries



Source: IMF World Economic Outlook / PIDE Reform Agenda (2021).

Another grave concern is that Pakistan's debt to GDP ratio has continuously been rising over the last decade. Research says that there is a negative linear association between debt and economic growth regardless of the types of debt and the countries' income levels. Moreover, since 1965, Pakistan has approached International Monetary Fund (IMF) twenty-two times; the recent engagement with IMF makes it the 23rd time.

Fig. 4. Debt to GDP Ratio



Estimated by Dr. Abdul Jalil, Professor at PIDE.

To put it bluntly, Pakistan has been a fixture in the emergency ward of the IMF. The question arises, is IMF the solution to what ails Pakistan? In the short term, perhaps. In the long run, definitely no. So, what is the solution? There has to be a long-term solution as short-term approaches have not worked. The only way out of the debt difficulties that Pakistan has been stuck in for the last 40 years has to be sustained, accelerated growth.

In parallel, the working-age population (15-64 years) is growing at a greater rate than the growth rate of Pakistan's total population. These increasing numbers entering the labour force will yield dividends for the country. If unemployed, this demographic window, or dividend, could be destabilising. Over 2.5 million new entrants of the working age are expected in the coming years. Applying current labour force participation rates to this number yields 1.5 million new jobs to be created in the economy for another two decades. With an increasing number of females entering the workforce, and if the goal of increased female participation is to be achieved, the labour force will have to expand by 2 million or more jobs a year for the next 20 years. The estimates developed using employment elasticity suggests that the economy must grow at least 7-9 percent if it provides gainful employment for future entrants into the labour market. Again, increasing growth and productivity is the only way to cope with the changing demographics and reap its dividend.

The PIDE Reform Agenda shows that investment and productivity are the two key drivers of growth in any country. Both are not only pretty low in Pakistan but have been in a downward spiral over the years. The real test then is to raise the investment rate and productivity substantially. Research has amply demonstrated that the state of institutions is a key determinant for long-term growth and development. Realising Pakistan's resource limitations, this study emphasises reforming institutions (laws, rules, procedures, and processes) to raise productivity and investment. Thus, the focus is on altering the software of growth to improve public and private investment productivity.

The recurring question is why has nothing worked so far? The answer lies in a lack of understanding of the construction of the social order in Pakistan, a matter of prime importance. The interactions of agents in society, whether economic or political, are based on personal relationships grounded firmly in kinship. No matter the system, these kinship links and systems of power and patronage will persist.

Pakistan's development conundrum and political economy cannot be sufficiently unraveled without understanding the dynamics of its social order. To better understand these dynamics, we must start with the concept that there are broadly two types of social order across the world, i.e. limited access order and open access order. Only a limited class or dominant coalition can access opportunities in the former case, and in the latter, everyone has access to opportunities indiscriminately. Through its research, PIDE has urgently advocated for ensuring access to opportunity across the board for Pakistan to prosper. It is high time to say goodbye to colonial legacies that still serve the interests of the few.

The crux of the matter is that Pakistan has to transition from limited access to an open access order for long-term and sustainable growth and development. For this growth to happen, the rules of the game must change. PIDE explains how.

Box 1. Limited Access Order & Open Access Order

Limited Access Order is a type of setting in which political system manipulates the economic system. In simpler words, it can be said that limited access order means that political or economic opportunities are only limited to privileged class. Entry of a common citizen to avail these economic and political opportunities are deliberately restricted by the elite groups. Creation of rents are essential to sustain order in this system; political system uses rents in this order to put limits on access to form organisations, rights to do certain kind of businesses.

Whereas, in Open Access Order; political, economic and other forms of competition help sustain the order. In this type of social order, political and economic opportunities are open for everyone and not restricted to any particular class. It has the provision for all the people or citizens to form organisations. Open access order not only creates and sustains both political and economic competition, but also have a rich civil society; so there is a large array of different kinds of organisations.

MAKING THE CASE

Without a doubt, Pakistan is in an economic tailspin and swiftly spiraling downwards. The country needs an instant economic roadmap to escape the current bedlam. The chaos is partly due to political mismanagement. If politics negatively impacts the economy, we are going in the wrong direction. Politics and economics must be delinked if we are to take on the path of economic growth and development in the real sense of the word. Politics is messy everywhere, but developed nations and many developing now have taken a principled stance to separate politics and economy into mutually exclusive domains. Hence, a charter of the economy is the need of the time across the board. Political consensus over this point is of critical importance. Implementing this charter in letter and spirit seems highly unlikely without a broad-based political consensus.

PIDE has been the flag bearer of this approach through its different research products. In particular, it has conducted dozens of webinars engaging renowned national and international economists, generating debate around the subject. The current economic crises and exceedingly high inflation have sent ripples across the country, with every Pakistani concerned about the economy and where Pakistan is heading. Hence, there is a

demand for an economic roadmap—a.k.a Charter of Economy. First and foremost, a pre-requisite of this is policy consistency for at least the next 15 years. Once there is a political consensus, there should be no 0ff-tracking from the set direction, whatever the case may be.

Thus, PIDE now presents its advocacy as a "Charter of Economy", to serve as a live document and a blueprint for future economic growth and development.

PIDE'S CHARTER OF ECONOMY

Set the Cabinet to 10 Members

Cabinet size matters; the number of top positions available affects the greater political game, with larger cabinets helping satisfy the ambitions of more politicians. The size of the cabinet also has fiscal implications. Ancient forerunners of the then cabinets were councils of trusted advisors around the ruler. These advisors could be non-specialised, with titles such as Royal Cupbearer. In contrast, modern cabinet members tend to be in charge of specific branches of administration. Their motivation is to expand the staff and expenditures, increasing their power. So, larger cabinets produce larger governments. This eventually impacts fiscal policy and may contribute to the deficit. Hence, a ten-member cabinet is proposed.

A Police Service, not a Police Force

A police force is essential for efficient and effective crime detection, prevention, and public order maintenance. Hence, enabling a conducive environment for economic activity, Foreign Direct Investment (FDI) in particular. Pakistan's police departments are notorious for the strings attached. Patron-client relationship and politicisation are primarily responsible for the existing state of Pakistan's police. The political elites have always used the police as a tool of subjugation and to supplement their political objectives which have ultimately politicised the police as a whole. For this reason, equal treatment of all the subjects by the police is out of the question. Therefore, to accomplish the requirements of the rule of law, it is binding on governments and state authorities to ensure that the police are a-political, autonomous, accountable, and professional community service. In the short run, Police Order 2002 must be implemented. Lastly, in the long run, Pakistan's police should transition from the mindset of a police force to that of a police service.

Establish an Independent Planning Commission (IPC)

An effective planning and development apparatus is essential for the economy's over-all health-helping unlock productivity, employment generation, creating dynamic, livable cities, optimal resource allocation without creating regional disparity, and so on. Almost the opposite has been happening in Pakistan, which calls for establishing an independent Planning Commission (IPC). It should be headed by a seasoned economist with a fixed tenure of service—for instance, six years at the minimum. A robust, independent IPC would strengthen the planning system by minimising the risk of corruption or undue political influence. This IPC must have public and open processes where all parties can have their say. Setting up an IPC would help build public confidence and trust in the planning system, even though individuals may disagree with specific outcomes. The IPC would also inherently ensure policy consistency in the long run—a must for a business-friendly ecosystem.

Merge Intersecting Ministries under the IPC

It is proposed that overlapping ministries such as finance, commerce and textile, industries and production, planning and development, energy, maritime affairs, and water resources should be fused with separate wings under the IPC. Such a step would robustly enhance coordination and result in synchronised planning, optimal resource allocation, and better outcomes.

Establish an Autonomous Budget Unit

The budget process in Pakistan is primarily off-track and takes a detour via the bureaucracy. In contrast, some developing countries have established an independent agency, the Parliamentary Budget Office (PBO)—a sovereign office that looks at the budget and national economy from a perspective that is dissimilar from that of the executives and provides an honest picture to the parliamentarians. Various parliaments across the globe also have autonomous budget units; the Philippines established its Congressional Budget Office in 1990, Mexico in 1998, Uganda in 2001, Canada in 2006, and lately, Afghanistan in 2007. Such units provide an independent, non-partisan view of the budget to parliamentarians and help significantly in reviewing the budget and developing an opinion on it. In this context, the Pakistani Parliament could also establish a Parliamentary Budget Office, comprising experts who can provide impartial budget analysis. This should then lead to an autonomous Budget Unit, comprising top experts from across the country, who would be engaged in focused, comprehensive budgeting of the country the year round, without any political influence. The budget proposed by this unit and the one approved should both be posted online for public scrutiny.

Make Public Investment Effective

Adopting a result-based management framework to boost the effectiveness of public investment. Brick-and-mortar projects should be shunned in favour of projects and initiatives involving software of the society. These may include investing in Research and Development (R&D), developing human capital, universal access to the internet, imparting technical education, encouraging entrepreneurship, etc. However, it must be ensured that project preparation and approval are informed by research, preferably undertaken at local universities.

Reimagine Cities

There is a sense of urgency to reimagine the cities of Pakistan as engines of growth. For that, we have to curb the bureaucratic machinery of the city, with commerce and entrepreneurship should take the driving seat. For this to happen, some interventions must be made to reform the overall functioning of the cities. Some of these are as follows: rigid master plans of cities should give way to lose guidelines; zoning should merely differentiate between city centers and suburbs; a city to be managed by a single authority; relax floor area ratio to allow high-rise buildings; develop the rental housing market; development of a car policy with salient features such as congestion tolls and paid street parking; apartment parking sold separately from the apartment; an efficient public transport that serves most parts of the cities, especially congested areas; street vending zones—street vending should

be looked at as a legal activity and establish street vending across the city; unlocking dead capital of the cities which includes most of the government land and put it to optimal use; develop proper downtown of cities and develop cities on the lines of a 15-minutes-city, where most of the essential utilities and facilities are available at 15 minutes walking distance. More people in little yet adequate space in vertical cities means more opportunity and demand, which would induce more supply and transactions; hence, more economic activity at the aggregate level.

Ensure Universal Internet Access

Universal and cheaper internet access is the need of the hour. The impact and the subsequent positive spillover effect make it an extremely urgent measure. Greater internet access would help raise the literacy rate through online education to deprived communities, providing health advice remotely in far-flung areas, enabling farmers and handicraft manufacturers to connect wholesalers and retailers directly in cities without intermediaries, and providing freelancing opportunities to many more, accelerating e-commerce. The advances in Artificial Intelligence (AI) and technology are triggering a full range of benefits that are difficult to calculate at this stage. Thus it is proposed to make the internet universally and cheaply accessible - consider fully funding fast internet access across the country till the end of 2025. For this, the sale of the spectrum (i.e. frequency) to telecom firms should be considered in terms of internet access rather than revenue generation.

Tax Reforms is a Must

Tax reform design and implementation should be based on four key areas. First, make the tax system more progressive and remove the tax breaks and concessions to the upper-income groups. Second, achieve a more straightforward, transparent, and friendly tax system. Third, build a more revenue-yielding and buoyant tax regime. Fourthly, establish mechanisms to check tax evasion and corruption.

Reforming Bureaucracy is Inevitable

Bureaucracy is the backbone of a country. If the bureaucracy is dysfunctional, one can assess the overall picture very well. That is why reforming bureaucracy—the Civil Service of Pakistan—must not be avoided at any cost. Reforming the civil service would require concrete steps, not just optics. First, the generalist colonial exam to recruit for a lifetime should be scrapped. If desired, university performance and achievement, intelligence, and psychological testing are adequate. Second, no lifetime and career guarantees are to be given. Instead, continuous recruitment at all levels without any guarantees to specific groups should be plugged in. Third, no service hierarchies as in the current system, with guarantees to any group to be in controlling positions. Fourth, continuous training of public servants is to be conducted at universities in specialised fields, so civil servants are well acquainted with global events, changing dynamics, and contemporary approaches for better service delivery. Fifth, no transfers across government to allow any single group to control all activities, especially given the costs incurred. Sixth, compensation to be generous on market terms (based on private-sector competitors) but purely in cash. The colonial system of perks, plots, privileges, ex-officio appointments, and arbitrary allowances was to be discontinued. The resources released will have a huge

growth impact. Lastly, while past pensions are overburdening the government and have to be met, the pension should be fully funded and invested. More- over, to allow and encourage mobility, pensions should be portable, and mobility between the private and public sectors must be encouraged.

Performance-based Government Employment

All agencies and levels of government are to be monitored by the HRM ministry, which would then prepare annual reports—comparing practices, salaries, and state of public service. In parallel, all agencies, levels of government, and departments are to make annual performance commitments for the coming three years and prepare reports on recent performance. The individual performances within the purview of departments and agencies would be subject to review by the Ministry of HRM.

Make an Autonomous Debt Agency

Establishment of an autonomous debt agency that would perform all functions and operations related to debt, technically, delinking it from the political narratives and influence. This agency would submit a report to parliament every quarter for reviewand discussion on the floor. This report would also be open for public discussion/public hearing for two days to incorporate diverse views. All the proceedings are to be made public.

Make the Authorities Independent

The Prime Minister or Chief Minister should not make top appointments by hand-picking a few people of his/her liking. This will limit his personal biases or perceptions and not compromise merit, deliberately or unintentionally. Every authority or department's head should be appointed on merit; give them full authority, so they can function independently, to implement their vision.

However, this should be complemented with checks and balances. In addition, all the heads of public sector agencies must submit biannual reports to the Parliament. Short-term targets to be outlined by the heads themselves for six months. Any head of the agency failing to meet the target below 60 percent twice in a row should be fired.

Establish a Growth Commission

PIDE views economic growth at the pivot, for most of Pakistan's ills. Thus, for sustained growth, there must be an independent Growth Commission. The Commission should comprise experts; no political appointments. It would perform all the functions and give informed policy advice related to promoting growth, in a technical manner, delinking it from politics. The Commission would submit a report to parliament bi-annually for review and discussion on the floor. This report would also be open for public discussion/ public hearing for two days to incorporate diverse views. All the proceedings to be made public.

Clarity of Vision regarding Exports

A comprehensive long-term export policy, reinforced by a well-chalked-out industrial policy that brings all stakeholders together, under the IPC, without which

Pakistan's exports are unlikely to grow and diversify sustainably. A 15-year Export Policy—where mechanisms would be fixed, with other things that might constantly change according to the fixed mechanisms—owned and monitored by an "Export Cell" at the independent Planning Commission, would give exports priority. This policy It is pertinent to note that the policy should be targeted to enhance competitiveness rather than spoon-feeding and must alter the mindset of the bureaucracy from control to empowerment.

Public Sector Enterprises (PSEs)—The White Elephant?

Public Sector Enterprises' losses cannot be allowed indefinitely. The best option is to privatise these entities. Another option could also be the transfer of management (but not equity) of PSEs to qualified experts in the private sector for a prescribed period on a profit and loss improvement arrangement in the proportion of 80:20, with the dominant beneficiary being the government. At a subsequent pre-agreed time, such entities could be privatised. The management agreement can be made conditional to safe- guard on involuntary reduction of headcount and prevent asset stripping. If restructuring or management transfer are options, then it would be necessary for the government to provide statutory legitimacy, authority, and empowerment for: exemption from PPRA rules on procurement; exemption from Public Sector recruitment regulations and give the board the authority, within a prescribed framework of due diligence, to appoint and reward people; remove such entities from the direct control of line ministries and fund the restructuring and deficit financing needs as per agreed plans.

MARKET REFORMS

Agriculture Market

Reduce the footprints of the government in the input markets, such as fertiliser, water, and extension, by letting the markets operate efficiently. The government should gradually exit from wheat and sugar markets—no fixation on minimum support price and no purchases by the government from farmers. Moreover, the mandated registration of seed supply firms through the Seed Act must be made a priority, and seed supply firms must be bound to label their products to cover any information gaps appropriately. Also, the approval process of new varieties needs to be revisited to reduce the government footprint. Likewise, adequately pricing irrigation water to encourage an efficient cropping pattern, along with developing a regulatory framework for ground water use.

Real Estate Market

First of all, development by housing societies and cooperatives should be abolished. Developing and building should be a business of bonded licensed builders. In parallel, the government must encourage real estate agent associations in various cities and regions on a self-policing and licensing system, agent responsibilities, and codes. Moreover, a system of open, transparent electronic titles to property through greater digitisation should be established, with little or no paperwork involved. Also, Deputy Commissioner (DC) rates should be eliminated; buyers and sellers must be allowed to negotiate the price. The government enjoys the right to buy at a declared price (this will keep buyers from declaring

low prices). In addition, brokers' groups must develop an online listing service, with no transaction/sale allowed without appearing on a listing service. Settlement attorneys handle transaction paperwork electronically to complete the sale in a week. Title agents search and guarantee titles against a fixed fee. Lastly, rental laws must be amended to allow Pakistan's rental investment industry to thrive.

Energy Market

The focus of the restructuring must be on renewables for electricity generation, as this distributed generation could offer a solution to retail competition and supply electricity to those areas where the national grid is not feasible. The electricity supply should shift to a pre-paid model using smart metering technology. The government should also seriously consider leasing out the difficult retail areas to the private sector for a certain period, while contracts should be awarded based on best performances. The government footprint in the state-owned DISCOs and tariff determination must be reduced.

Natural Gas Market

Firstly, outsource retail management to control theft, and install high-quality measurement devices to address the issue of Unaccounted for Gas (UFG). Secondly, the elimination of 'Return on Assets' for allowing gas distribution companies to profit; the profits should come from operational efficiency. Thirdly, a single consumer tariff based on a cost-of-service should be implemented. Fourthly, revisiting long-term LNG agreements to unlock some of the gas volumes and allow purchase by other parties (third-party access) on short-term contracts or in the spot market. Lastly, achieving convergence between the price of piped indigenous gas and RLNG.

Fuel Oil Market

The role of government in pricing and allocation should be minimal, with petroleum prices determined weekly on a cost-of-service basis linked to international oil prices. Ex-refinery prices to be based on international practice—the regulator to set an upper limit based on the weighted average of the import prices of all OMCs. Enhancement of oil trading and vessel chartering expertise of the PSO. Outsource oil procurement based on performance contracts.

CONCLUSION

In conclusion, let PIDE tell you a story. Have you ever imagined what the real problem with Pakistan is and what is the way out? Have you ever seen a rich man asking about the prices of vegetables? No, he doesn't bother, as inflation is not his problem. Have you ever observed an affluent person whining about load-shedding? No, as he can install a generator or alternative energy source. Have you ever seen a wealthy individual com- plain about contaminated drinking water? No, as he can buy bottled water. The list goes on. The crux of this anecdote is that if you have enough money, the prices of most things won't bother you. Pakistan's predicament is similar. The issue relates to growth. Everything else would fall in place. Therefore, PIDE proposes that Pakistan must grow at 7-9 percent, other crucial issues would settle down through the spillover as well as the ripple effect of that

much growth. How it will grow at this rate; the roadmap has already been explained above: Reform, facilitate, privatise, digitise, and de-regulate are the few buzzwords as key takeaway.

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From Imports to Exports—An Achievement of Mobile Phone Industry

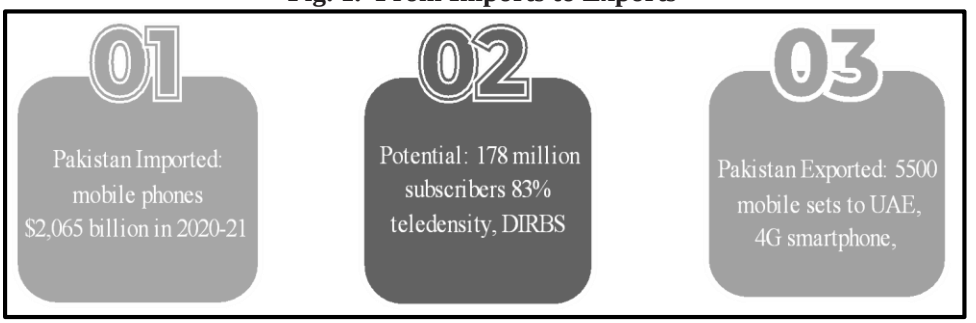
UZMA ZIA

Pakistan has performed in local hand set manufacturing and has gradually become exporter of mobile phones. Being a new product for exports, no specific export targets were set before but the "domestic increase in production of handsets" and "initiating export successfully" is encouraging. The local mobile phone manufacturing industry is expected to promote Pakistan's in-house handset manufacturing, exports, the digital economy through providing mobile services particularly in the form of mobile broadband and hence; enhancing digital connectivity, ecosystem & innovation.

INTRODUCTION

The mobile device manufacturing is one of the top five industries in the world that plays an important role in impelling economic growth. Pakistan has a huge market for mobile phones but majority of those handsets were being imported in Pakistan since 2020-21 (Table 2). Almost 51 percent increase in imports of handsets was observed in FY 2020-21 (PBS). Side by side, Pakistan's trade sector discovered some potential and tried its best to encourage Mobile phone industry to be able to become an exporter through certain quick reforms. To serve the purpose, Mobile Device Manufacturing Policy (2020) set three key targets: Localisation, Production and Exports (see Figure 4).[1] The right policy measures showed fruitful results and Pakistan became an exporter of handsets (see Figure 1).

Fig. 1. From Imports to Exports



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[1] Mobile Device Manufacturing Policy (2020).

Initial data evidence shows an enormous accomplishment as the country was mainly an importer of mobile phones till 2021 and almost importing mobile phones of worth $2,065 billion in 2020-21(PBS). After realising potential in market, the country decided to move towards exports of mobile phones and recently managed to export 5,500 units of 4G smart mobile sets to UAE (Haider, 2021).

Table 1

Key Facts and Expectations of Pakistan Mobile Phone Market

Mobile Phone Market	Key Facts & Expectations
Annual Pakistan handset market size	45 million*
Market size (in terms of value)	US$2.5 billion *
Imports increased in FY 2020-21	51 percent to over $ 2 billion (PBS)
Imports in 2019	28 million*
Phones available in country in near future	90 percent expected to be made in Pakistan
Expected employment (jobs) due to localisation, production and exports	200,000 to half million
4G Smartphone exporter	Inovi telecom exported 5500 4G mobile handsets to UAE (Haider, 2020) Airlink Communication exported 1500 locally manufactured smartphones to UAE
The Mobile Device Manufacturing (MDM) Regulations introduced	January 2021

*https://profit.pakistantoday.com.pk/, based on import data by the Pakistan Bureau of Statistics (PBS).[2]

Government of Pakistan assessed potential in mobile phone manufacturing and decided to provide a policy framework that aims essentially to promote local manufacturing of PTA approved mobile devices in country. The "Mobile Device Manufacturing Policy 2020" addressed the central issues faced by mobile device manufacturers and to provide an attractive tariff environment over the policy period, besides other non-tariff [3] initiatives to promote "Make in Pakistan" strategy for mobile devices.

IMPORT DATA FACTS

Pakistan imported mobile phones worth $2.065 billion during 2020-21 compared to $1.369 billion during 2019-20, showing growth of 50.75 percent. The overall telecom imports into the country during the period under review (July-June) 2020-21 increased by 39.33 percent by going up from $1.861 billion in 2019-20 to $2.593 billion during 2020-21. The manufacturers produced 12.27 million mobile phones while importers brought in almost 8.29m units during 2021.[4]

[2] Pakistan Bureau of Statistics.

[3] An additional import restriction: State Bank Pakistan's (SBP's) import approval requirement that could be taken as a non-tariff barrier aiming at increasing import costs for a set of 25 products that had seen a sharp increase in imports between FY21. Gonzalo (2022), Pakistan's import ban. (https://profit.pakistantoday.com.pk/2022/05/27/pakistans-import-ban/)

[4] https://www.dawn.com/news/1643056

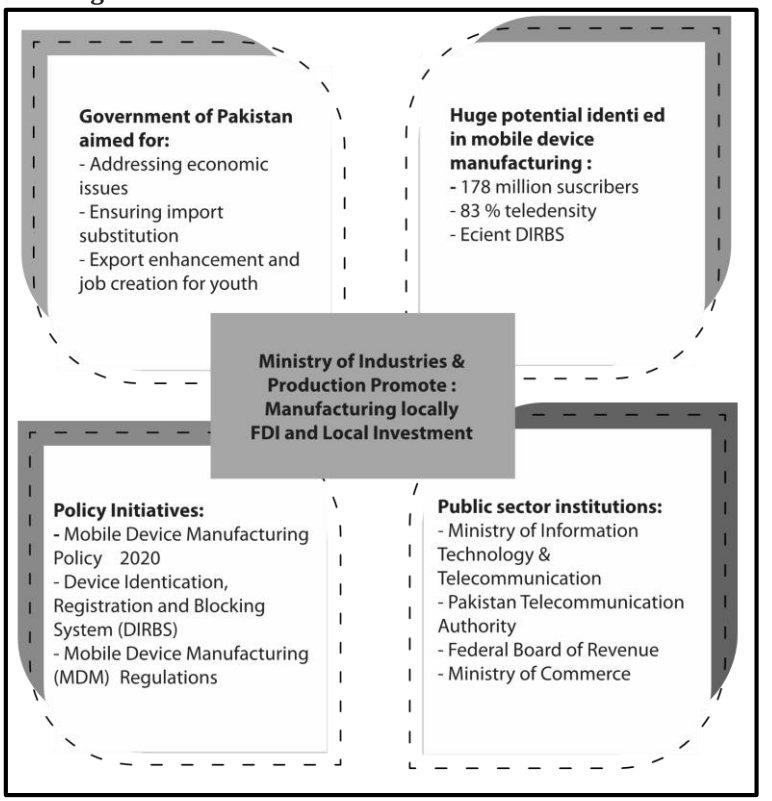
Table 2

Value of Telecom Imports in Pakistan

Machinery Group	July-June 2019-20 Value in (000) US $	July –June 2020-21 Value in (000) US $	% change
Telecom	1,861,106	2,593,357	39.34
Mobile Phones	1,369,943	2,065,168	50.75
Other Apparatus	491,163	528,189	7.54

Source: PBS.

Fig. 2. Role of Public Sector Institutions and Policies

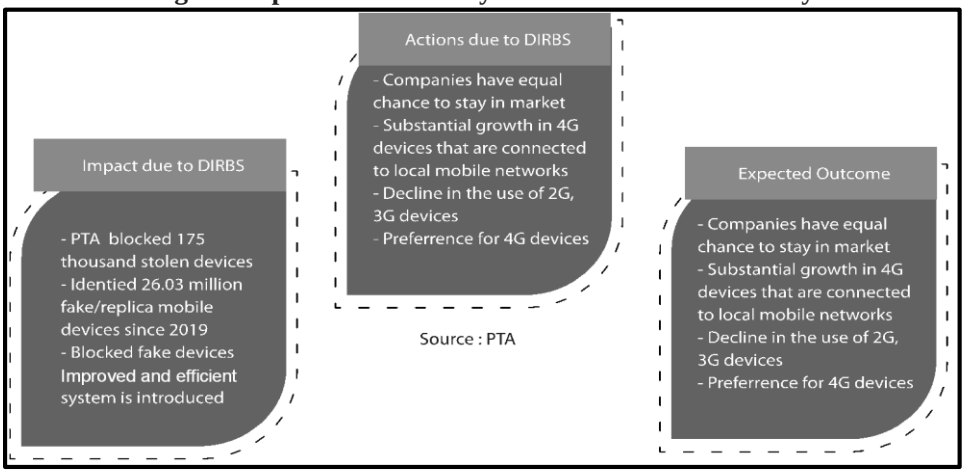


MARKET POTENTIAL

Pakistan has a benefit of low-cost labour availability, a fairly large home market having more than 178 million subscribers, which have increased approximately "1 percent" per month during last year alone, 83.3 percent tele-density and useful Device Identification, Registration and Blocking System (DIRBS).[5] DIRBS has not directly resulted in export of mobile handsets but Pakistan provides an attractive arena/ market for in house mobile assembling. Initiating of DIRBS has become very advantageous in terms of encouraging legal imports and local manufacturing.

[5]Launched by Pakistan Telecommunication Authority. https://www.pta.gov.pk/en

Fig. 3. Impacts of DIRBS System on Pakistan Economy



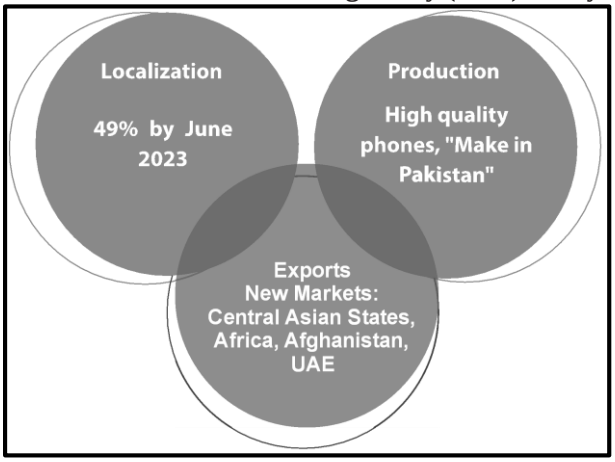
Source: PTA.

MOBILE DEVICE MANUFACTURING POLICY (2020) POLICY TARGETS

(1) The Mobile Device Manufacturing Policy set a 49 percent localisation target by June 2023, including 10 percent localisation of parts of the motherboard and 10 percent localisation of batteries. Currently Pakistan is concentrating on low-end mobile phone sets and soon expected to be able to start getting into high-end phones with world class companies.

(2) After achieving a milestone in manufacturing, Pakistan is trying exports to regional countries and Africa. one or two containers have already moved out of the country. Pakistan is looking forward to target markets in Afghanistan, the Central Asian Republics and Africa, UAE (Figure 4) and then more diversification into the higher end market. The target is to penetrate low-end of export market and move up the value chain.

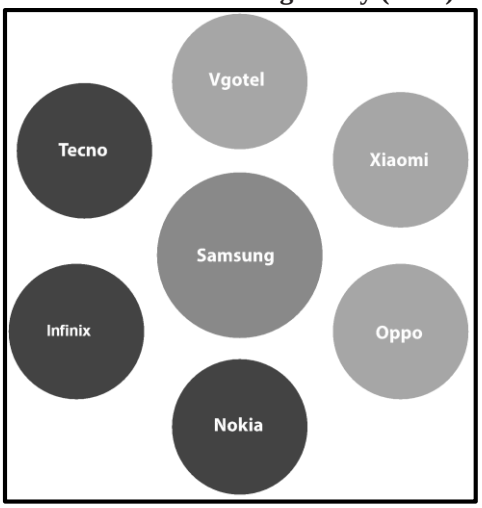
Fig. 4. Mobile Device Manufacturing Policy (2020) Policy Targets



POLICY OUTCOME AND ACHIEVEMENTS IN MANUFACTURING SECTOR AND EXPORTS

The role of public sector policy initiatives cannot be ignored in providing a boost to this sector. Factors for mobile phones rising demand may be manifold. Broadly it is due to the mobile phone policy incentives, reduction in taxes, recent changed work style and educational online trends, preference of new technology, ease in usage and time saving etc. The policy has targeted investment in the sector and investment policy outcome is clear with the evidence of key new mobile phone investors in the country (Figure 5). Recently, after the first effective consignment of 4G smartphones to the UAE in 2022, the government has now fixed mobile phone export target at $1 billion for the current FY, connecting it with the incentives offered to local manufacturers.[6]

Fig. 5. Mobile Device Manufacturing Policy (2020) Policy Targets



Source: PTA.

Recently several mobile set manufacturers have expressed willingness for investing in Pakistan. Samsung, one of these manufacturers that has partnered with Lucky Cement Limited to set up an assembly plant for locally manufacturing the smart mobile phones. According to PTA, almost 26 companies have been issued MDM authorisation enabling them to manufacture mobile devices in Pakistan. The companies include renowned brands e.g. Samsung, Nokia, Oppo, TECNO, Infinix, Vgotel, Q-mobile and others.

Various Chinese mobile phone manufacturers are already investing in Pakistan and have played a key role in Pakistan's mobile phone industry's output boom in 2021. The Itel company has managed to manufacture 3.91 million mobile devices followed by VGO Tel at 2.97 million, Infinix 2.65 million Vivo 2.45 million, Techno 1.87 million, QQMEE 0.86 million and Oppo 0.67 million (Source: PTA). The situation is encouraging and will help the nation in achieving the goal of exporting and sustainable development as well as making Pakistan a global exporter of mobile devices.

[6] https://www.dawn.com/news/1643056

Local Production Increased

- Big success of Mobile phone manufacturing in 2021.
- Pakistan has become 4G exporter.
- Exported the first badge of 1500 locally manufactured smartphones to the United Arab Emirates (UAE).

Investment in Market/Chinese Players

- About 3.91 million mobile devices manufactured by Itel.
- VGO Tel manufacturing was at 2.97 million, Infinix 2.65 million Vivo 2.45 million, Techno 1.87 million, QQMEE 0.86 million and Oppo 0.67 million (*Source:* PTA).

Local Manufacturing Capacity Increased

- Local manufacturing plants assembled 9.03 million smartphones while the number of 2G mobile phones was 13.09 million.
- Pakistani phone manufacturers are now assembling major brands.

Attracting Investment

- "Make in Pakistan" policy attracted investors to contribute for the development of electronic eco-system. New Firms entering in the market.
- New firms will offer good quality, low-priced mobile handset devices.
- The Mobile Device Manufacturing (MDM) Regulations of January 2021 encouraged manufacturers to establish their units in Pakistan.

Employment for Youth

- Employment opportunities for talented youth and to local technical and semi-technical manpower.
- By increasing localisation, production, and exports Pakistan will create further 200,000 to half million jobs in the country.

CONCLUDING REMARKS

Pakistan's mobile phone manufacturing industry has shown its potential to increase domestic production of handsets, after implementation of new Mobile Devise Manufacturing Policy (2020) and Devise Identification Registration and Blocking System. Through new investments/incentives and DIRBS the country has managed to create favourable business environment and hence Pakistan become an exporter. This encouraging development will promote the exports of handsets in future. Correspondingly, being an exporter, there will be a boost in the digital economy through providing mobile services particularly in the form of mobile broadband and hence; enhancing export revenue, digital connectivity, ecosystem & innovation. The handset manufacturers are determined to meet the policy challenges of localisation, production, and exports which will not only create jobs in the country but will improve export competitiveness. Introducing successful policies and efficient DIRBS has restored investors' confidence to invest in Pakistan.

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RESEARCH FOR SOCIAL TRANSFORMATION AND ADVANCEMENT
RASTA Competitive Grants Programme for Policy-oriented Research
Pakistan Institute of Development Economics, Islamabad
www.pide.org.pk/rasta

DDR CALL FOR RESEARCH PROPOSALS (Nov '22)

The '***Research for Social Transformation and Advancement***' (RASTA) is the largest economics and public policy research grants programme in Pakistan. RASTA's mission is to develop an extensive research network of academia and think tanks across Pakistan producing high-quality, evidence-based policy research to inform Pakistan's public policy process. The objectives of RASTA programme are to:

(i) Reduce research-policy gap by stimulating economic and social science research and debate across Pakistan.
(ii) Provide a knowledge-sharing / generating platform where different actors can present and share evidence-based research to inform decision-making in the government.
(iii) Revisit the public policy agenda in line with the evidence produced in this programme.
(iv) Build capacity and improve policymaking and implementation by involving and engaging local universities, think tanks, policymakers, practitioners, and other stakeholders.

With these objectives, the programme seeks to develop local thought communities and generate knowledge. Substantial outputs will be completed in critical areas of public policy that will produce insightful research and facilitate goals that the Government wants to achieve according to its vision. So far, RASTA has awarded 49 research projects in four rounds of the Competitive Grants Programme (CGP) worth PKR 129 million, and commissioned 18 research projects under Demand Driven Research (DDR) programme worth PKR 182 million. More information about RASTA is available at: www.pide.org.pk/rasta.

The RASTA is pleased to invite research proposals on specific research topic under DDR, i.e., ***Cities Regeneration***. To give clarity to what exactly is expected from the research projects, detailed TORs are provided for the guidance of interested applicants. It is anticipated that this approach will help the potential applicants to formulate questions and design their research in line with the TORs, and also prepare good research proposals that will increase their probability to win DDR research grant from RASTA. Details are provided in the section below.

Note: Although applicants are encouraged to formulate/ submit research proposals on the given topic, the research design may vary according to the choice of locale and anticipated business plan.

DDR CALL FOR RESEARCH PROPOSALS (Nov '22)

RASTA Demand Driven Research (DDR) programme invites research proposals on the following topic:

CITIES REGENERATION

City regeneration is a forgotten subject in Pakistan as all efforts are encouraging urban sprawl (See: Haque (2015, 2020) and Haque & Nayab (2019). Proposed studies may seek to develop ideas on city regeneration in Pakistan.

The *scope* may include:

(A) Identification of an area in your city that has a large opportunity cost and is ready to rejuvenate. It should be a prime locale that is in despair, crowded, and rezoning and redesigning could increase investment significantly. Such areas are often occupied by old disused/underutilised buildings/offices but have large land that can benefit the city. For instance, government residences or land owned by Pakistan Railways, Auqaf, and/or Evacuee Trust Property Board, all carry extensive land holdings.

(B) In these areas, the study must plan to rezone and redesign for maximum benefit to cities, economy, and employment. City regeneration usually involves mixed-use high-rise developments with community and public spaces that maximise economic and social benefit. Innovative equity enhancing solutions are suggested. All such rejuvenation will be based on maximal private investment. Government seed investment must be recoverable. Land value capture must be considered.

(C) The study must justify reasons for selecting certain locale. Explicitly identify the opportunity cost. Explore and present detailed plan for rejuvenation keeping in view (i) to make modern spaces of walkability, density, mixed use with community, public and flexible spaces to allow people to adjust their demands, and (ii) rezoning and design – not on public investment. Private investment must be at the heart of all plans.

(D) The study must present calculations: (i) costs to the state of infrastructure and development, (ii) gains to the state and economy in terms of revenue generation, both short- and long-term, (iii) possible investment by the private sector – must catalyse enough private investment to generate a surplus for the government, not a deficit, (iv) possible foreign investment, (v) employment gains, both short- and long-term, (vi) resulting numbers of new housing units, commercial units, & other kinds of spaces – creating gentrification and poor housing balance, and (vii) other gains to the community and public space.

(E) Study examples from international practices of such city rejuvenation in European, Asia and/or American cities (read Dag Detter & Stefan Fölster's *The Public Wealth of Cities: How to Unlock Hidden Assets to Boost Growth and Prosperity*). Create case study by taking one case of such regeneration as an example and illustration of what the proposed research is suggesting. This should be of a high standard covering aspects of the regeneration in detail.

(F) The regeneration (business) plan must have enough information with maps and detailed knowledge of the area to outline (i) the evolution of that

particular locale, (ii) existing zoning, building rules, and proposed changes in existing regulations, (ii) the existing shortages and indicators of demand and how the proposed plan would address these, (iii) flexible mechanisms to allow changing demand to meet evolving needs, (iv) how will the regeneration plan change the lifestyles, commerce, and entrepreneurship, and (v) while gentrification might happen, can there be safeguards for inclusion.

DDR GRANT DESCRIPTION

This is RASTA demand Driven Research (DDR) call for research proposals, November 2022. Research proposals are invited on the above listed research topic.

Considering nation-wide scope of the Call, multiple projects (from different cities and/or locale) may receive funding. Proposed studies must conduct/present a comprehensive background research and incorporate the scope given above. Preferably, the study would require a research team comprising of economists, town planners, and architects.

Submit proposals using prescribed (RASTA D-1, D-2, & D-3 Forms, available on RASTA website) by Wednesday **30th November 2022**, midnight (PST).

All submissions will be thoroughly reviewed, and progress of research projects will be closely monitored by the 'Research Advisory Committee' (RAC) of RASTA. Following are the broad principals of the programme:

(1) The maximum duration to complete the said project will be 06 months (per study).
(2) The maximum grant available for the said project is PKR 3.5 million (per study).
(3) Proposals will be evaluated by the choice of the problem (locale) and expected knowledge outcomes for countrywide or local development.
(4) It is mandatory to justify how the proposed research is relevant & valuable to public policy in Pakistan and justify the contribution and establish link with the existing government policy/ strategy.
(5) Applications will be thoroughly reviewed and discussed by the members of the RAC and the Review Panel before reaching the Award decision.
(6) Only shortlisted teams will be invited to present their proposals before the RAC in the DDR Review Workshop.
(7) Mentor(s) will be assigned to provide technical assistance on each award study and M&E Desk at RASTA will facilitate the research process.
(8) The Mentors and the PMT will monitor progress and evaluate all the deliverables, i.e., inception report, mid-term (interim) report, & final report.
(9) All data collected and work produced under RASTA will have to be submitted for authenticity checks.
(10) Multiple conferences/workshops/webinars will be organised allowing all reviewers, RASTA Fellows and sector specialists to see progress and develop network learning.

(11) There are no purchases (of both hardware and software) allowed under DDR.
(12) Female applicants, university students and researchers from less developed areas of Pakistan are encouraged to participate in the RASTA programme.
(13) To keep it fair, RAC members' family members (including parents, spouse and children) are NOT eligible to participate in DDR projects.

APPLICANTS' QUALIFICATION

Research proposals are solicited from qualified individuals (and/or group of individuals) interested in the economic development and public policy issues of Pakistan, including faculty members and staff at international and local universities and research institutes within and outside Pakistan. Freelancers, policy specialists and/or practitioners may also submit proposals to win the DDR Awards. Research proposals are encouraged from Pakistani graduate students enrolled in PhD and thesis-based MS/MPhil degree programmes at Pakistani and foreign universities, and/or from faculty members to support the research of these students.

DDR APPLICATION GUIDELINES

Elements of the Grant Application

English is the language to be used in the RASTA DDR Grants Programme. All DDR applications must include the following:

(1) RASTA Form D-1 (Cover Sheet)
(2) RASTA Form D-2 (Research Proposal - Technical)
(3) RASTA Form D-3 (Proposed Budget)
(4) Additional Documents:

- *For professional applicants*: A brief curriculum vitae (1-3 pages) for Principal Investigator/Co-PI.
- *For university student applicants*: (i) Official transcript of graduate coursework completed and list of planned additional course enrolment, and (ii) A letter of recommendation from the applicant's research supervisor.

Submission Process and Deadline

Download the RASTA Application Forms (D-1, D-2 and D-3) from RASTA website. Complete forms (in MS Word format) must be submitted electronically to rasta@pide.org.pk before the given deadline. Complete applications will be acknowledged by return email within 14 days after the submission deadline.

- Do NOT mention your name and/or organisation anywhere except in Form D-1 (Cover Sheet). The application will not be processed in case of non-compliance. There is no need to submit a hardcopy of the application.
- The deadline for applications submission is **30th November 2022** by midnight, Pakistan Standard Time (PST). Incomplete applications and applications received after deadline will not be considered.

Budget Guidelines

The maximum grant available for a project is 3.5 million. Remuneration of maximum Rs. 150,000 per month for each member of the research team. A research team can be comprised of a maximum of four members, including the PI. The Co-PIs should not get paid more than the PI. Income tax on remuneration will be deducted at source. For field visits/data collection, TADA/accommodation costs can be included as per the Federal Govt rules. A maximum of 03 percent contingency and 10 percent institutional overhead of the calculated budget are permissible; to be included within the upper limit of the grant.

Disbursement of Funds

The disbursement of award money will occur in three tranches linked to the deliverables:

- 30 percent upon selection of the proposal for an award and submission of *Inception Report*
- 30 percent upon satisfactory acceptance by the review panel of an *Interim Report* & presentation at the Mid-Term Review Workshop; and finally
- 40 percent upon satisfactory acceptance by the review panel of the project's final *Research Paper/ Report* & presentation at the RASTA event.

  - *Note: There is No provision for any hardware/software purchases including data, books, laptop, software, equipment etc.*
  - *Publishing, printing and dissemination of the study is the responsibility of RASTA. Fellows shall provide duly verified receipts of all expenses. If there is any unspent balance, it will be adjusted in the 3rd instalment. Detailed accounting procedures will be shared with the RASTA Fellows.*

EXPECTED OUTPUTS & RESEARCH DISSEMINATION

RASTA Fellows are expected to present their papers in the RASTA Conference and at other national and/or international conferences/research events. There would be two types of publications: (a) RASTA Conference Papers/Reports, and (b) RASTA: Local Research, Local Solutions Volumes.

All Fellows will be asked to produce one or two RASTA Policy Briefs for wider research dissemination.

The RASTA programme will organise multiple research events. RASTA Fellows are expected to make two presentations of their work: (a) a presentation corresponding to their interim research report at the Mid-Term Review Workshop, and (b) a final presentation corresponding to their research paper at the RASTA Conference. Members of the RAC and other invitees from public and private sectors will participate in these events.

RASTA PROJECT MANAGEMENT TEAM

The RASTA programme is managed by the Project Management Team (PMT) at PIDE, Islamabad. The RASTA PMT manages all programme activities under the leadership of Dr Nadeem Ul Haque, Chairman RAC / Vice Chancellor, PIDE Islamabad and Dr Faheem Jehangir, Project Director, RASTA / Senior Research Economist, PIDE

Islamabad.

The PMT, stationed at an independent Project Management Unit, is responsible for the administration of grant selection procedure made by the scholarly RAC, disbursement of funds based on the fulfilment of the grant requirements by recipients, and other operational aspects of the programme. For more details about the RASTA PMT, visit RASTA website.

RASTA RESEARCH ADVISORY COMMITTEE

The RASTA is guided by a scholarly Research Advisory Committee (RAC), chaired by Dr Nadeem Ul Haque, Vice Chancellor, PIDE Islamabad. The members of the RAC are well-reputed national and international researchers, academics, practitioners, international economic development scholars, and senior federal and provincial government officials. The role of RAC is critical from the call for applications stage to final submission of the research paper. Each member of RAC critically reviews research proposals, participates in the decision to award funds, monitors the progress, and mentors some awarded research studies during the course. For more details about the RAC, visit RASTA website.

FOLLOW & CONTACT RASTA

For queries and/or correspondence related to the RASTA programme, write to **rasta@pide.org.pk**

For latest updates and activities, follow **@RASTA_PIDE** on Twitter.

RASTA Project Management Unit
Pakistan Institute of Development Economics
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PAKISTAN SOCIETY OF DEVELOPMENT ECONOMISTS

Registered Office:
Pakistan Institute of
Development Economics,
P.O. Box 1091 ,
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DEGREE	YEAR	UNIVERSITY

EXPERIENCE IN YEARS

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S.NO.	Title	Year

MEMBERSHIP FEE. Rs 20 00.00 (in Pakistan), US$ 200.00 (overseas members). Please send a crossed cheque to the Pakistan Society of Development Economists.

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Signature of Applicant

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DATE APPLICATION RECEIVED	THROUGH (Name of Proposers)	MEMBERSHIP FEE RECEIVED AS ABOVE
	1.	
	2.	

☐ Application Accepted ☐ Application Rejected

REMARKS

PARTICULARS OF MEMBERSHIP

RENEWAL DATE	RENEWED YES/NO	RENEWAL DATE	RENEWED YES/NO	RENEWAL DATE	RENEWED YES/NO

Dated

Secretary

For conditions of eligibility for Membe rship, see reverse.

EXTRACTS FROM THE CONSTITUTION OF THE PAKISTAN SOCIETY OF DEVELOPMENT ECONOMISTS

ARTICLE 5

5.3 *Membership:* There shall be a select category of Members of the Society. The minimum criteria of eligibility for election as Member of the PSDE are:

(a) Previous *ex-officio* membership of the society;

or

(b) Master's degree in Economics, Business Administration, Public Administration, Agricultural Economics, Statistics Econometrics or Economic Demography and/or an evidence of proven scholarship in these areas of specialisation.

5.4 *Election of Member:* All persons satisfying the minimum eligibility criteria as specified in Article 5.3 may apply for Membership on the prescribed form after having their nominations duly proposed and seconded by any two *Ex-officio* Members/Members of the Society, provided that no such application shall be required of a former *Ex-officio* Member of the Society who may enrol as Member on payment of the prescribed fee at the invitation of the Council. Election to Membership shall be decided by a simple majority of the Executive Council at a constitutionally valid meeting.

THE PAKISTAN DEVELOPMENT REVIEW

Editor: **Nadeem Ul Haque**

The Pakistan Development Review is an internationally refereed journal published regularly by the Pakistan Institute of Development Economics since 1961. The journal focuses on economics and related social sciences and welcomes theoretical and empirical contributions in relevant disciplines with a particular emphasis on Pakistan's socio-economic issues. The journal is published on a tri-annual basis. The journal's editorial and advisory boards consist of more than 18 renowned scholars in the fields of economics and related social sciences. The actively participate in refereeing the papers and also render valuable advice on other related matters.

AIM AND SCOPE

The aim of the journal is to encourage original scholarly contributions that focus on a broad spectrum of development issues using empirical and theoretical approaches to scientific enquiry. With a view to generating scholarly debate on public policy issues, the journal particularly encourages scientific contributions that explore policy relevant issues pertaining to developing economies in general and Pakistan's economy in particular.

ABSTRACTING AND INDEXING

The Pakistan Development Review is indexed and/or abstracted in the EconLit, Scopus, CAB abstracts, Ekistic Index of Periodicals, etc.

THE PAKISTAN DEVELOPMENT REVIEW

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INSTRUCTIONS FOR AUTHORS

1. All manuscripts submitted for publication should be in English. All submissions, or queries, should be sent by email to: pdr@pide.org.pk. A submission implies that the research work has not been published previously, that it is not under consideration for publication elsewhere and is approved by all authors. The journal also has the policy to verify the originality of the submissions through originality detection service.
2. Each request for a book review in the journal must be accompanied by one copy of the relevant book, which should be submitted to: The Editor, *The Pakistan Development Review*, Post Box 1091, Islamabad-44000, Pakistan.
3. Manuscripts will be accepted for consideration on the understanding that they are original contributions to knowledge in social science fields.
4. All articles should be organised into the following sections: (i) Abstract of 150 words highlighting major contribution and summary of findings followed by *JEL* classification and at least six Keywords, (ii) Introduction covering the hypotheses, objectives of the work, adequate background and literature review highlighting the key gaps in the literature and how the research fills those gaps, (iii) Data and Methodology, (iv) Results and Discussion, and (v) Conclusions and Policy Implications. Sub-sections should carry clear and distinct sub-headings.
5. Each manuscript should be typed single-spaced in times new roman font size 12 (MS WORD) on one side of quarto sheets, and should carry a margin of an inch and a half on the left-hand side of the typed page and of at least an inch on each of the remaining three sides. The total word count of the manuscript should be between 6000-8000 words.
6. The first page of the manuscript should contain: the self-explanatory title of the paper, the name(s) of author(s), and a footnote giving the current affiliation of the author(s), funding agency (if any) and any acknowledgements.
7. As a courtesy to referees, detailed derivations of the main mathematical results reported in the text should be submitted separately along with the articles.
8. Tables for the main text and each of its appendices should be numbered serially and separately. The title of each table as well as the captions of its columns and rows should be clearly expressive of the contents. The source of the table should be given in a footnote immediately below the line at the bottom of the table; but, unlike other footnotes, which must be numbered consecutively, it should not be numbered.
9. Graphs should be sent in editable form and not as pictures. They should be presented in a way that is best suited for black and white printing.
10. Footnotes should be numbered consecutively. Each appendix and each table should have a separate set of footnotes.
11. All references should be arranged on APA style which should be organised through electronic referencing management softwares such as Mendeley and EndNote.
12. The author(s) of each article will receive complimentary copies of *The Pakistan Development Review* in which the relevant contribution appears.
13. Any change in the names of the author(s) after the initial submission is not allowed. Author(s) should make sure to list the names of all contributors, their order and corresponding author before submission.
14. The Journal strictly follows all ethical considerations. At the time of submission, the author(s) are required to disclose potential "conflict of interests" that could inappropriately influence (bias) their work.
15. The journal has no processing/publication fee.

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Annual Subscription	Rs 100.00	Rs 250.00
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Per copy of the Regular Issue	US$ 40.00	€ 35.00	US$ 55.00	€ 45.00

About RASTA

The *Research for Social Transformation and Advancement* (RASTA) at the Pakistan Institute of Development Economics (PIDE) is the largest economics and public policy research grants programme in Pakistan. Its mission is to promote research culture and develop an extensive network of academia and think tanks across Pakistan producing high-quality, evidence-based policy research to inform public policy processes.

The *Competitive Grants Programme* (CGP) is the flagship initiative of RASTA under which research proposals are invited bi-annually on specific themes/topics decided by the Research Advisory Committee (RAC). Applications from all around Pakistan and abroad are invited through open competition and awards are decided by the RAC after a rigorous and transparent review process. Anyone with a research focus on Pakistan's public policy issues relevant to the themes/topics of each round can participate in CGP. Through the *Demand Driven Research* (DDR) programme, RASTA fulfils the demand for research on several pertaining issues in the government, both at the federal and provincial levels, highlighted by the government organizations, RAC members and experts at PIDE.

For details, visit **www.pide.org.pk/rasta**,
email us at **rasta@pide.org.pk,**
and follow us on Twitter **@RASTA_PIDE**

PDR

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